BJ-300
BJ-330

SERVICE MANUAL

Canon

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual could include technical inaccuracies or typographical errors due to improvements or changes in the products. When changes occur in applicable products or in the content of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new editions of this manual.

The following paragraph does not apply to any countries where such provisions are inconsistent with local law.

Trademarks

The product names and company names described in this manual are the registered trademarks of the individual companies.

Copyright

This manual is copyrighted with all rights reserved. Under the copyright laws, this manual may not be copied, reproduced or translated into another language, in whole or in part, without the written consent of Canon Inc., except in the case of internal business use.

Copyright © 1990 by Canon Inc.

CANON INC.
Peripheral Products Technical Document Dept.
30-2 Shimomaruko 3-Chome, Ohta-ku, Tokyo 146, Japan

This manual was produced on an Apple Macintosh™ II CX personal computer and Apple LaserWriter™ II NTX-J laser beam printer; final pages were printed on Varityper™ 5300 with 4000-J RIP. A Canon mo-5001S Magneto-Optical Storage Subsystem with mo-502M Magneto-Optical Storage Disk Cartridge and mo-IF2 interface kit were used for storing large volumes of page layout and graphic data for this manual.
All graphics were produced with Aldus FreeHand™ 2.0J.
All documents and all page layouts were created with QuarkXPress™ 2.0J.

I. ABOUT THIS MANUAL

This manual is divided into four sections, and contains information required for servicing the unit.

Part 1: Safety and Precautions

This section tells you how to service the unit safely. It is very important, so please read it.

Part 2: Operating Instructions

This section explains how to operate the unit properly. Information required about installation and service made and a copy of User's Manual are also included. For more details of specifications, see the copy of the User's Manual.

Part 3: Technical Reference

This section outlines the way the unit operates so you can understand it technically.

Part 4: Maintenance

This section explains how to maintain the unit. Descriptions of assembly/disassembly, adjustment for assembly, troubleshooting procedures, and wiring/circuit diagrams are given.

Procedures for assembly/disassembly are not given in this manual. See the illustrations in the separate Parts Catalog.

II. TABLE OF CONTENTS

Page	
	Part 1: Safety and Precautions
1 - 1	1. DANGER TO PERSONNEL
1 - 1	1.1 MOVING AND ROTATING PARTS
1 - 1	1.2 INK NEEDLE
1 - 2	1.3 INK STAINS
1 - 3	2. DANGER TO EQUIPMENT
1 - 3	2.1 PRECAUTIONS ON INSTALLATION
1 - 4	2.2 PRECAUTIONS ON OPERATION
1 - 4	2.3 MAINTENANCE PRECAUTIONS
1 - 6	3. PROTECTIVE FUNCTION
1 - 6	3.1 PROTECTIVE FUNCTION OF BJ CARTRIDGE
1 - 7	4. BUILT-IN SELF-DIAGNOSTIC FUNCTION
	Part 2: Operating Instructions
2 - 1	1. PRINTER SETUP
2 - 1	1.1 UNPACKING
2 - 2	1.2 INSTALLATION SPACE
2 - 3	1.3 INSTALLATION PROCEDURE
2 - 4	2. TRANSPORTING THE PRINTER
2 - 4	2.1 TRANSPORTING THE PRINTER
2 - 5	3. PRINTER SERVICE FUNCTIONS
2 - 5	3.1 ERROR DISPLAY WITH INDICATOR LAMPS
2 - 6	3.2 CONTROL KEY SERVICE FUNCTION
2 - 6	3.2.1 CLEANING BUBBLE JET HEAD
2 - 8	3.2.2 OFFLINE TEST
2 -12	3.2.3 ONLINE TEST
2 -13	4. USER'S MANUAL
	Part 3: Technical Reference
3 - 1	1. PRODUCT LINE
3 - 1	1.1 OVERVIEW OF COMPONENTS
3 - 1	1.1.1 PRINTER SET
3 - 2	1.1.2 OPTIONS
3 - 3	1.1.3 CONSUMABLE
3 - 4	2. OVERVIEW OF PRINTER
3 - 5	3. PRINTER SPECIFICATIONS
3 - 6	4. PRINTER MECHANISMS
3 - 6	4.1 BUBBLE JET HEAD
3 - 6	4.1.1 BUBBLE JET HEAD
3 - 6	4.1.2 BUBBLE JET HEAD STRUCTURE
3 - 8	4.2. INK PASSAGE
3 - 9	4.3 PURGE UNIT
3 - 9	4.3.1 PURGE UNIT FUNCTIONS
3 - 9	4.3.2 PURGE UNIT STRUCTURE
3 -11	4.4 INK CARTRIDGE

3-12 4.5 CARRIAGE SECTION
3-12 4.5.1 CARRIAGE SECTION FUNCTIONS
3-12 4.5.2 CARRIAGE SECTION
3-13 4.6 PAPER FEED SECTION
3-13 4.6.1 PAPER FEED SECTION FUNCTIONS
3-13 4.6.2 PAPER END DETECTION SECTION
3-14 5. OUTLINE OF ELECTRICAL SYSTEM
3-14 5.1 BLOCK DIAGRAM
3-15 5.2 CONTROL LOGIC UNIT
3-15 5.2.1 LOGIC BOARD
3-16 5.2.2 LOGIC BOARD COMPONENTS
3-18 5.2.3 CARRIAGE BOARD
3-19 5.3 POWER SUPPLY UNIT
3-19 5.3.1 POWER SUPPLY UNIT FUNCTIONS
3-19 5.3.2 POWER SUPPLY UNIT STRUCTURE

Part 4: Maintenance

4-1 1. MAINTENANCE
4-1 1.1 PERIODICALLY-REPLACED PARTS
4-1 1.2 CONSUMABLES
4-1 1.3 PERIODIC MAINTENANCE
4-2 2. DISASSEMBLY AND ASSEMBLY
4-2 2.1 OUTLINE OF DISASSEMBLY AND ASSEMBLY
4-2 2.1.1 OUTLINE
4-2 2.1.2 REQUIRED TOOLS
4-3 2.1.3 DISASSEMBLY AND ASSEMBLY PRECAUTIONS
4-4 2.2 DISASSEMBLY PROCEDURES
4-4 2.2.1 UPPER CASE UNIT
4-5 2.2.2 PURGE UNIT
4-7 2.2.3 CARRIAGE UNIT
4-8 2.2.4 BUBBLE JET HEAD
4-9 3. ADJUSTMENTS
4-9 3.1 ADJUSTMENT POINTS
4-10 3.1.1 PRINT POSITION ALIGNMENT ADJUSTMENT
4-11 3.1.2 CARRIAGE WIDTH SETTING
4-11 3.1.3 PURGE GEAR INSTALLATION
4-12 3.1.4 RELEASE LEVER INSTALLATION
4-12 3.1.5 FOLDING FLEXIBLE CABLE
4-14 4. TROUBLESHOOTING
4-14 4.1 BEFORE TROUBLESHOOTING
4-14 4.1.1 TROUBLESHOOTING OVERVIEW
4-15 4.1.2 PRECAUTIONS WHEN TROUBLESHOOTING

4 -16 4.2 ERROR DIAGNOSIS
4 -20 4.3 ERROR ANALYSIS
4 -21 4.3.1 CANNOT INITIALIZE
4 -22 4.3.2 ERROR INDICATION
4 -23 4.3.3 POOR PRINT QUALITY
4 -26 4.3.4 PAPER ERROR
4 -28 4.3.5 PAPER CANNOT BE LOADED
4 -29 4.3.6 PAPER IS LOADED AND EJECTED
4 -30 4.3.7 INK ERROR
4 -32 4.3.8 INK DOES NOT FLOW
4 -33 4.3.9 HP SENSOR NG
4 -34 4.3.10 PAPER FEED MOTOR NG
4 -35 4.3.11 CARRIAGE DRIVE MOTOR NG
4 -36 4.3.12 OPERATOR PANEL NG
4 -37 4.3.13 POWER SUPPLY UNIT NG
4 -38 4.3.14 INTERFACE NG
4 -39 5. WIRING DIAGRAM
4 -39 5.1 WIRING DIAGRAM
4 -40 5.2 LOCATION AND SIGNAL ASSIGNMENT
4 -40 5.2.1 CONNECTOR LOCATION AND ASSIGNMENT
4 -49 5.2.2 SENSOR AND ACTUATOR PIN ASSIGNMENT
4 -55 5.2.3 CONNECTOR AND CABLE PIN ASSIGNMENT
4 -57 5.3 CIRCUIT DIAGRAM
4 -65 5.4 CIRCUIT PATTERN DRAWING
4 -65 5.4.1 CIRCUIT PATTERN DRAWING(Logic Board)
4 -66 5.4.2 CIRCUIT PATTERN DRAWING(Carriage Board)

III. ILLUSTRATION INDEX

Page			
	Part 1: Safety and Precautions		
1 - 1	Figure	1-1	Needle Cap
	Part 2: Operating Instructions		
2 - 1	Figure	2-1	Packing Arrangement
2 - 2	Figure	2-2	Installation Space
2 - 5	Figure	2-3	Operator Panel
2 - 6	Figure	2-4	Nozzle Pattern Test
2 - 8	Figure	2-5	Test Print Header
2 - 9	Figure	2-6	All Character Printing Test
2 -10	Figure	2-7	All Ripple Pattern Printing Test
2 -11	Figure	2-8	H Pattern Print Test
2 -11	Figure	2-9	Dot Pattern Print Test
	Part 3: Technical Reference		
3 - 1	Figure	3-1	Printer
3 - 1	Figure	3-2	Ink Cartridge
3 - 1	Figure	3-3	User's Manual
3 - 1	Figure	3-4	Programmer's Manual
3 - 2	Figure	3-5	Serial Interface Board
3 - 2	Figure	3-6	1st Bin Auto Sheet Feeder
3 - 2	Figure	3-7	2nd Bin Auto Sheet Feeder
3 - 2	Figure	3-8	Font Card
3 - 3	Figure	3-9	Ink Cartridge
3 - 6	Figure	3-10	Bubble Jet Head
3 - 8	Figure	3-11	Ink Passage
3 - 9	Figure	3-12	Purge Unit
3 -11	Figure	3-13	Ink Cartridge
3 -13	Figure	3-14	Paper Passage
3 -13	Figure	3-15	EOF Sensor
3 -14	Figure	3-16	Block Diagram
3 -16	Figure	3-17	Logic Board
3 -18	Figure	3-18	Cartridge Board
3 -19	Figure	3-19	Power Supply Unit
3 -20	Figure	3-20	Sensor Actuator Location
	Part 4: Maintenance		
4 -10	Figure	4-1	Dot Pattern Alignment Adjustment
4 -11	Figure	4-2	Carriage Width Setting
4 -11	Figure	4-3	Purge Gear Installation
4 -12	Figure	4-4	Side Gears Installation
4 -12	Figure	4-5	Operator Panel Cable Setting
4 -13	Figure	4-6	Carriage Cable Setting

Page		
4-39	Figure 4-7	Wiring Diagram
4-40	Figure 4-8	Logic Board
4-46	Figure 4-9	Carriage Board
4-48	Figure 4-10	Power Supply Unit
4-49	Figure 4-11	HP Sensor
4-49	Figure 4-12	Paper Width Sensor
4-50	Figure 4-13	Bubble Jet Head
4-51	Figure 4-14	Operator Panel
4-52	Figure 4-15	EOF Sensor
4-52	Figure 4-16	Ink Sensor
4-53	Figure 4-17	Paper Feed Motor
4-53	Figure 4-18	Carriage Drive Motor
4-54	Figure 4-19	Electrode Unit
4-54	Figure 4-20	Paper Release Sensor
4-55	Figure 4-21	Extension Cable
4-65	Figure 4-22	Circuit Pattern Drawing (Logic Board)
4-66	Figure 4-23	Circuit Pattern Drawing (Carriage Board)

1. DANGER TO PERSONNEL

1.1 MOVING AND ROTATING PARTS OF PRINTER

Take care that your fingers, hair, clothes, jewelry, etc., do not get caught in the moving and rotating parts of the printer.

These parts are the drive belt, carriage (driven by the carriage drive motor), and the gear section, eject roller, paper feed roller and purge unit section (driven by the paper feed motor).

1.2 INK NEEDLE

When the purge unit is removed from the printer and serviced, install the needle cap on the ink needle to prevent danger.
The needle cap is installed on the purge unit (service part) for protection and is designated as a tool.

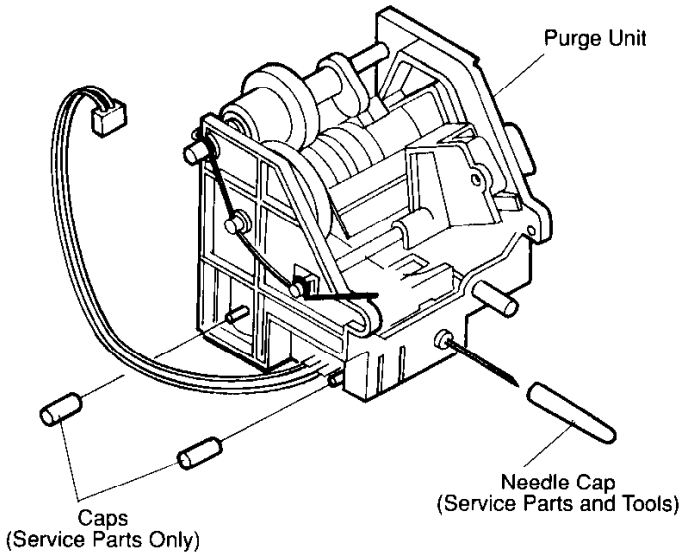


Fig 1-1 Needle Cap

1.3 INK STAINS

Do not touch anything in the printer ink path, otherwise the printer, work bench, your skin, or your clothes may get stained. The ink passes through the ink cartridge, purge unit and bubble jet head.

The ink is not harmful for human body. Do not swallow it or splash into your eyes. The ink characteristics is water soluble, but contains dye. Ink cannot be removed if it gets on your clothes.

2. DANGER TO EQUIPMENT

2.1 PRECAUTIONS ON INSTALLATION

1) Installation conditions

Install the printer at a place that meets the environmental specifications described in Part 3: Technical Reference of this manual. See also Part 2: Operating Instructions.

2) Printer installation procedure

Install the printer as outlined in Part 2: Operating Instructions of this Manual.

Before turn on the printer, release the carriage lock.

3) Bubble jet head protection

Do not touch the nozzles of the bubble jet head, wipe them with tissue paper, etc. If a nozzle is clogged, a horizontal white line appears on the print periodically. If this print defect is not corrected by cleaning, the bubble jet head must be replaced with a new one.
Do not touch any part other than the specified parts when removing the bubble jet head to protect the head from damage by electrostatic discharge.
The bubble jet head must not be disassembled or washed with water.

4) Ink cartridge protection

Do not disassemble the ink cartridge; otherwise, ink leaks, remaining ink detection is inaccurate, or the ink cartridge is incorrectly recognized.
The ink cartridge must not be refuel.

2.2 PRECAUTIONS ON OPERATION

See Part 2: Operating Instructions of this manual for precautions on operation.

2.3 MAINTENANCE PRECAUTIONS

1) Power on/off

This will ensure the cartridge gets capped properly. The minimum internal of power on and off is two seconds.

Do not switch the power off or disconnect the power cord while the printer is printing.

The bubble jet head is capped to prevent it from drying when the printer is not printing. If the printer power is switched off during printing, the capping operation is not performed.
If the nozzles of the bubble jet head do not get capped they may get clogged with dried ink, or ink may leak from the cap section during transportation.

2) Ink conductivity

The ink characteristics in the cartridge is electro conductive. If ink leaks on to a mechanical part, wipe it off with a damp towel. If ink leaks on to logic board, wipe it completely off the bottoms of the IC's with tissue paper.

Never switch the power on, if there has been a leak. The circuit may be damaged.

3) Damage by electrostatic discharge

Electrostatic discharge from the human body, produced by clothing friction, may damage electronic components or the bubble jet head. To prevent this, touch a properly grounded metal (such as a water tap) to discharge static electricity from the body before handling a PCB or bubble jet head.

4) Handling plastic parts

Plastic components of the printer mechanism are fastened with hooks and notches rather than screws.
Be careful not to deform or damage any of these hooks and notches.

5) Handling bubble jet head

The bubble jet head (service part) is delivered without ink. Once filled with ink, the head must not be stored.

6) Repacking

See Part 2: Operating Instructions of this manual for precautions to be taken when repacking the printer.

When repacking the printer, lock the carriage to prevent ink leakage during transportation.

If the carriage does not work by pressing a key on the printer, manually move the carriage to the lock position and lock it.

7) Transportation

Transport the printer horizontally; do not place it on one side or upside down.

3. PROTECTIVE FUNCTION

3.1 PROTECTIVE FUNCTION OF BUBBLE JET HEAD

The printer has the protective function to protect the bubble jet head.

1) Capping function

The printer caps the nozzles of the bubble jet head with the purge unit cap after the carriage returns to the position left to the purge unit. This prevents the cartridge drying up, ink leaking, and dust adhering.

NOTE The nozzles are capped automatically if the printer has not received a print start commands in the last twelve seconds while online.

If the nozzles are not capped, they may get clogged because the ink dries up, or ink may leak from the cap section.

2) Maintenance jet function

The printer has a maintenance jet function that ejects ink from all the nozzles of the bubble jet head to the cap of the purge unit to prevent the nozzles clogging and produce stable printing.

NOTE The maintenance jet function automatically operates when turn on the printer, before printing starts, every 12 to 30 seconds during printing, or every 1 hour for 24 hours after power on.

3) Cleaning function

To maintain print quality, the printer has a cleaning function that wipes dust off the nozzle of the bubble jet head surfaces with a rubber wiper or an ink absorber and fills the nozzles with fresh ink.

NOTE The cleaning is done automatically (*) and it is operated when the user or service person operates keys(**) if a print defect, such as blurred letters.

*
The cleaning function is automatically performed when the power is switched on, before printing starts, or when printing starts after 24 hours or more.

**
When the *SHIFT* key, then the *CLEANING* key are pressed in the offline mode or when the *CLEANING* key and *SHIFT* key are pressed then the *CLEANING* key is released in the offline mode, the cleaning operation is performed.

Reinforced aging operation

When paper is installed in the offline mode, and the *SHIFT* key is pressed and released, then the *CLEANING* key is pressed, finally the *CLEANING* key is released after the *PITCH* and *FONT* keys are pressed simultaneously, the reinforced aging operation is performed; the *ONLINE* and *LOCKOUT* lights flash.

The reinforced aging operation if the print quality is not corrected by cleaning and ink is emitted from all the nozzle.

The reinforced aging operation, 118 lines (two A4 - or - letter-size sheets) are printing paper in black to remove stains from the heaters in the bubble jet head.

When reinforced aging is complete, the beeper sounds and the light on the operator panel flashes.
If an error occurs during reinforced aging, the beeper sounds and the light on the operator panel flashes.
If the beeper sounds and the light flashes, switch the power off, then on again.
If reinforced aging is performed continuously, the service life of the head may be shortened. Reinforced aging should be performed only when required, when the bubble jet head is replaced or when troubleshooting is performed.

3.2.2 OFFLINE TEST

When paper is loaded at the paper feed position at the rear of the printer, the printer can perform the offline self test without being connected to the computer.

a) All character print

When the power is switched on and the *LF/FF* key is held down until the beeper sounds, all the characters provided in the printer are printed; the *ONLINE* light flashes.

When the *LF/FF* key is pressed, then released while the characters are being printed, printing pauses. When the *LF/FF* key is pressed again, printing of all the characters restarts from the beginning. The all-character printing test is terminated when the *ON LINE* key is held down.

The printer ROM version and function selector (DIP switch) setting are printed on the test print header.

The settings of the three function selectors are indicated by numbers. The leftmost digit indicates selector No. 1; 0 is OFF and 1 is ON.

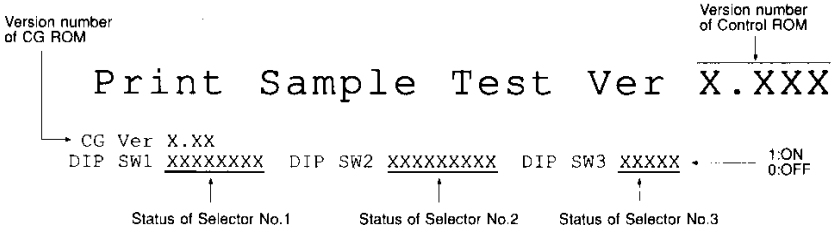

Version number of CG ROM
Version number of Control ROM
Print Sample Test Ver X.XXX
CG Ver X.XX
DIP SW1 XXXXXXXX DIP SW2 XXXXXXXXX DIP SW3 XXXXX
1:ON 0:OFF
Status of Selector No.1
Status of Selector No.2
Status of Selector No.3

Figure 2-5 Test Print Header

NOTE

Two lines of the Courier, Prestige, and Gothic fonts are printed in the HQ mode at each of 10, 12, 15, 17, 20, and PS pitch. HS, HQ, double high, double wide, emphasize, double strike, Italic, shadow, outline, reversed image, shading, superscript/subscript, underline, and overlines are printed at 10 pitch.

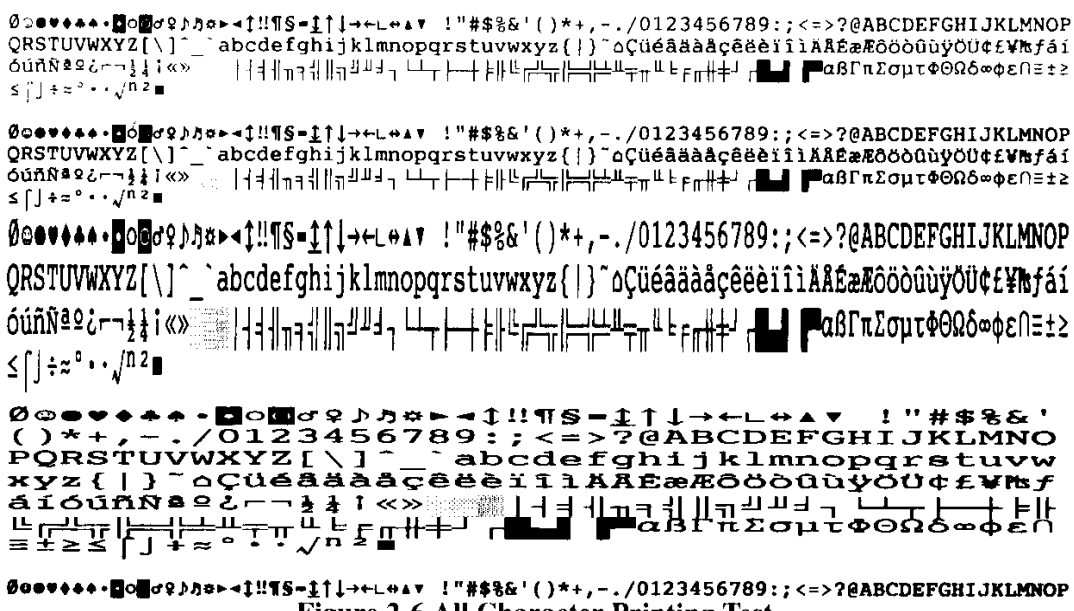


Figure 2-6 All Character Printing Test

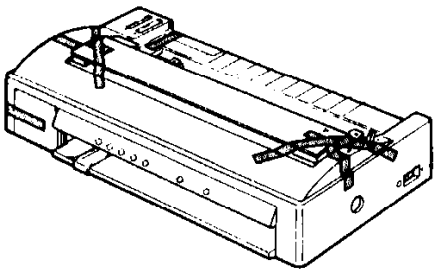
4. BUILT-IN SELF-DIAGNOSTIC FUNCTION

The printer has a self-diagnostic function to analyze hardware failures. The result of the self-diagnosis is indicated by an indicator and the beeper. For details, see Part 4: Maintenance of this manual.

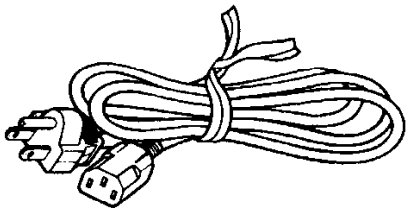
1. PRINTER SETUP

1.1 UNPACKING

After unpacking, check that you have the following parts:



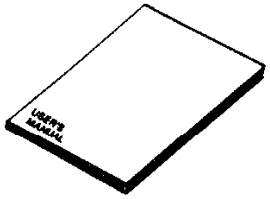
Printer (including ink cartridge)



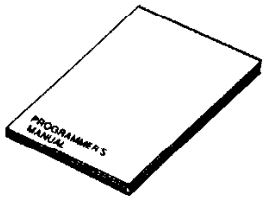
Power Cord

Knob

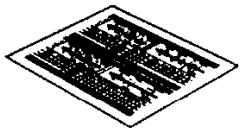
Continuous Forms Guide



User's Manual



Programmer's Manual



Switch Setting Label

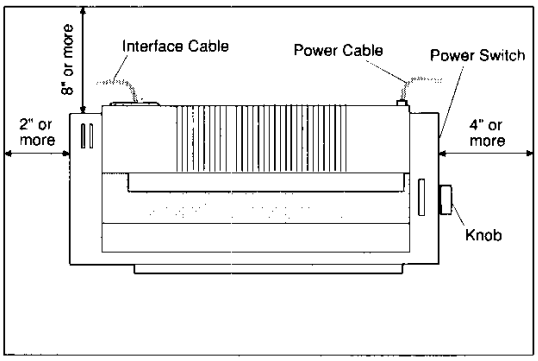
Panel Overlays

Figure 2-1 Packing Arrangement

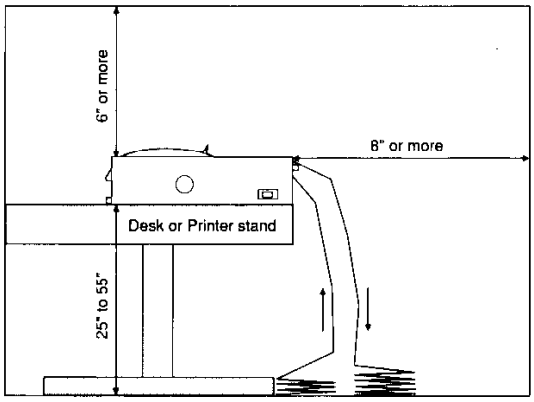
1.2 INSTALLATION SPACE

The installation space required for using the printer efficiently is shown below. The clearances shown below are required to operate keys on the operator panel and the power switch, loading paper (up to 16 × 11 inch size), and connecting the interface cable and power cable.

Top View



Side View



Rear View

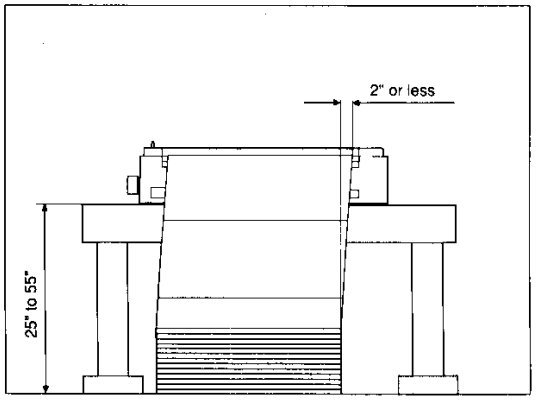


Figure 2-2 Installation Space

1.3 INSTALLATION PROCEDURE

Refer to Section 1. Setup in the User's Manual for the printer installation procedure.

2. TRANSPORTING THE PRINTER

When carrying or transporting the printer lock the carriage and leave the ink cartridge in it. If the carriage is not locked or the ink cartridge is removed from the printer during transportation, ink may leak inside the printer.

2.1 TRANSPORTING THE PRINTER

To transport the printer, do the following:

1) Lock the carriage. (Refer to VII-4 Transportation and Storage in the User's Manual for the carriage locking method.)
2) Disconnect the interface cable and power cable.
3) Pack the printer with the original packing materials.

If the original packing materials have been thrown away, pack the printer with plenty of shock-absorbing material.

3. PRINTER SERVICE FUNCTIONS

3.1 ERROR DISPLAY WITH INDICATOR LAMPS

The printer has a service function that signals printer errors with 12 lights on the operator panel and the beeper.

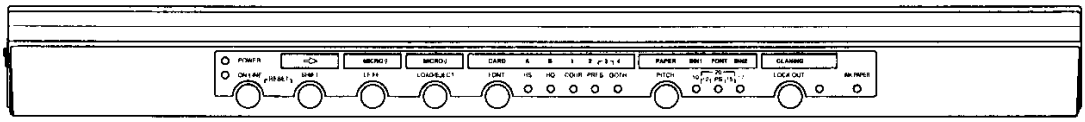


Figure 2-3 Operator Panel

Error state	*POWER*	*ON LINE*	*INK/PAPER*	*HS/CARD A*	*HQ/CARD B*	Beeper
Power off	Off	Off	Off	Off	Off	Off
Paper-out/paper jam	On	Off	On	–	–	Three times
No ink/ink cartridge	On	Off	Flashing	–	–	Three times
Home position error	On	Off	Off	Flashing	Flashing	Six times
ROM/RAM error	On	Off	Off	Flashing*	Flashing	Six times
Battery low (RAM CARD)	On	Off	Off	Off	Flashing	Off

* The *COUR*, *PRES*, and *GOTH* lights also flash.

For details of the functions of the indicators when the printer is operating normally, see the User's Manual.

3.2 CONTROL KEY SERVICE FUNCTION

The service functions such as bubble jet head cleaning and self-tests can be performed by operating the seven control keys and the power switch on the operator panel.

3.2.1 CLEANING BUBBLE JET HEAD

Cleaning

When the *SHIFT* key is pressed in the offline mode, and then the *CLEANING* key is pressed and released, the bubble jet head is cleaned; the *ONLINE* light flashes.

NOTE The printer wipes dust off the nozzle surfaces of the bubble jet head with an ink absorber and rubber wiper and fills the nozzles with fresh ink to maintain print quality. Cleaning takes about 13 seconds.

After cleaning, press the *LF/FF* key to print one line of a nozzle test pattern and feed the paper.

Figure 2-4 Nozzle Test Print Pattern

NOTE If a key other than the *LF/FF* key is pressed after cleaning, the nozzle test pattern is not printed even when the *LF/FF* key is pressed.

If the printed pattern is blurred or unstable or not printed, perform long cleaning.

Long cleaning

When the *SHIFT* key is pressed and released in the offline mode, then the *CLEANING* key is pressed, finally the *CLEANING* key is released after the *SHIFT* key is pressed, long cleaning operation is performed; the *ONLINE* light flashes.

NOTE The dust on the bubble jet head nozzle surfaces is wiped off with an ink absorber and rubber wiper, and the nozzles and ink supply system are filled with fresh ink to maintain the good print quality. Long cleaning takes about 30 seconds.

After cleaning, press the *LF/FF* key to point one line of a nozzle test pattern and feed the paper.

NOTE If a key other than the *LF/FF* key is pressed after cleaning, the nozzle test pattern is not printed even when the *LF/FF* key is pressed.

If the nozzle test pattern is not printed or the printed nozzle test pattern is blurred or unstable, perform troubleshooting.

b) Ripple pattern print test

When the power is switched on and the *SHIFT* key is held down until the beeper sounds, a ripple pattern print test begins; the *ONLINE* light flashes.

When the *SHIFT* key is pressed, then released, the ripple pattern print test pauses.

When the *SHIFT* key is pressed again, the ripple pattern print test resumes from the beginning.

The ripple pattern print test is terminated when the *ONLINE* key is held down.

Figure 2-7 All Ripple Pattern Printing Test

c) Auto sheet feeder bin 1 test

(valid only when the optional auto sheet feeder bin 1 is installed)

When the power is switched on and the *LOAD/EJECT* key is held down until the beeper sounds, an auto sheet feeder bin 1 test begins; the *ONLINE* light flashes.

When the *LOAD/EJECT* key is pressed, then released, the auto sheet feeder bin 1 test pauses. When the *LOAD/EJECT* key is pressed again, the auto sheet feeder bin 1 test resumes from the beginning.

The auto sheet feeder bin 1 test is terminated when the *ONLINE* key is held down.

d) Auto sheet feeder bin 2 test

(valid only when the optional auto sheet feeder bin 2 is installed)

When the power is switched on and the *HOST LOCK* key is held down until the beeper sounds, an auto sheet feeder bin 2 test begins; the *ONLINE* light flashes.

When the *HOST LOCK* key is pressed, then released, the auto sheet feeder bin 2 test pauses. When the *HOST LOCK* key is pressed again, the auto sheet feeder bin 2 test resumes from the beginning.

The auto sheet feeder test is terminated when the *ONLINE* key is held down.

e) H pattern printing

When the power is switched on and the *FONT* key is held down until the beeper sounds, an H pattern print test begins; the *ONLINE* light flashes.
When the *FONT* key is pressed, then released, the H pattern print test pauses.
When the *FONT* key is pressed again, the H pattern print test resumes from the beginning.
H pattern printing is terminated when the *ONLINE* key is held down.
This test enables a visual check of vertical line irregularity.

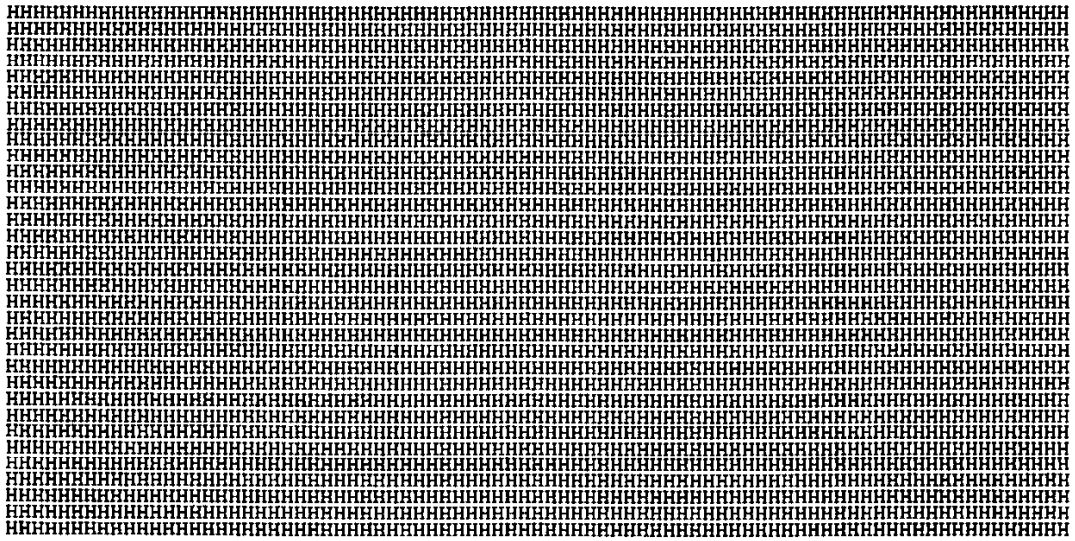


Figure 2-8 H Pattern Print Test

f) Dot pattern print test

When the power is switched on and the *PITCH* key is held down until the beeper sounds, a dot pattern print test begins; the *ONLINE* light flashes.
When the *PITCH* key is pressed, then released, the dot pattern print test pauses.
When the *PITCH* key is pressed again, the dot pattern print test resumes from the beginning.
The dot pattern print test is terminated when the *ONLINE* key is held down.
This test is used to adjust print position alignment.

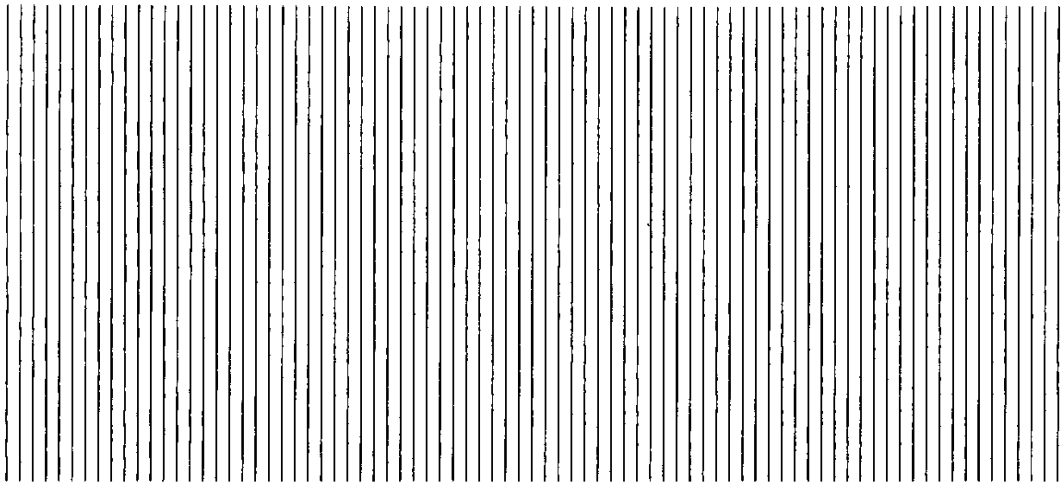


Figure 2-9 Dot Pattern Print Test

g) Carriage test

When the power switched on and the *SHIFT* and *LOAD/EJECT* keys are held down until the beeper sounds, a carriage test begins; the *ONLINE* light flashes.
When the *SHIFT* and *LOAD/EJECT* keys are pressed, then released, the carriage test pauses. When the *SHIFT* and *LOAD/EJECT* keys are pressed again, the carriage test resumes from the beginning.
The carriage test is terminated when the *ONLINE* key is held down.
This test is used to check the carriage operation without printing.

3.2.3 ONLINE TEST

a) Hex dump test mode

When the power is switched on and the *SHIFT* and *LF/FF* keys are held down until the beeper sounds, the printer enters the hex dump test mode; the *ONLINE* light flashes.

The hex dump test mode is terminated when a key reset operation is performed. (i.e. the *ONLINE* and *PITCH* keys are pressed simultaneously in the offline mode) or when turn off the printer. The signals transmitted from the computer are printed in hexadecimal rotation in the hex dump test mode to check whether data is correctly transmitted.

Part VI — Specifications

1. Hardware Specifications VI-1
2. Interface Specifications VI-4

1. Hardware Specifications

(1) BJ-300 (80-column)

Printing Method: Serial bubble jet ink-on-demand
Print Head: 1×64-dot bubble jet nozzle
Print Head Life: Approx. 100 million LQ chracters (MCTF)
Approx. 200 million Draft chracters (MCTF)
Printing Speed: LQ (HQ) mode: 150 CPS at 10 CPI
Draft (HS) mode: 300 CPS at 10 CPI
Printing Direction: Bidirectional in text mode
Unidirectional in image mode
Line Feed Pitch: 1/6″, 1/8″, n/72″, n/216″, n/360″ (n: programmable)
Line Feed Speed: 40ms/line
Form Feed Speed: 27ms/line
Printing characters:
Font: Courier, Prestige, Gothic
Pitch: 10, 12, 15, 17, 20 CPI and PS
Composition: 36×48 dot matrix in HQ mode
18 out of 36×48 dot matrix in HS mode
Character set: IBM code page 437, 850
EPSON international character set

Maximum Number of Characters per line:

Pitch	Maximum Number of Characters
10 CPI	80 CPL
12 CPI	96 CPL
15 CPI	120 CPL
17 CPI (10 CPI Condensed)	136 CPL
20 CPI (12 CPI Condensed)	160 CPL
Proportional	Varies
Proportional Condensed	Varies

(CPI: characters per inch; CPL: characters per line)

Graphic Bit Image Print:
Data Format: Vertical 8, 24, and/or 48-dot format
Mode: 72 dpi graphic image mode
180 dpi graphic image mode
360 dpi graphic image mode

Input Buffer: 30KB
Interface: 8-bit parallel*
* RS232C and RS422 serial interfaces are optionally available.

Paper Handling: Paper Type: Plain paper

For Cut Sheets:

	Width	Length	Weight
Manual Loading	90 to 297 mm (3.5″ to 11.7″)	90 to 431.8 mm (3.5″ to 17″)	52 to 128 g/m^2
Automatic Sheetfeeder	148 to 257 mm (5.8″ to 10.1″)	90 to 364 mm (3.5″ to 14.3″) (BIN 1) 182 to 364 mm (7.2″ to 14.3″) (BIN 2)	60 to 90 g/m^2

Envelopes: Commercial number-10 envelopes can also be loaded in the front opening, or BIN 1 of the Automatic Sheetfeeder.

For Fan Fold Paper:

	Width:	101.6 to 254 mm (4" to 10")
	Weight:	52 to 90 g/m²

Optional Automatic Sheetfeeder Capacity:

	BIN1:	10 mm thickness 10 envelopes (commercial number 10) max.
	BIN2:	10 mm thickness
Ink Cartridge:	Type:	Single cartridge ink supply
	Ink Color:	Black
	Ink Amount:	Approx. 40 g
	Life:	1 million characters in HQ mode
Acoustic Noise Level:	Approx. 45 dB(A)	
Operating Environment:	Temperature:	10°C to 35°C
	Humidity:	10% to 80% RH (non condensation)
Storage Environment:	Temperature:	−30°C to 50°C
	Humidity:	10% to 95% RH (non condensation)
Power Source:	USA/Canada:	AC 120 V 60 Hz 0.36 A
	UK/Australia:	AC 240 V 50 Hz 24 W
	Europe:	AC 220 V 50 Hz 24 W
Physical Dimensions:	Size:	458 mm (W)×333 mm (D)×137 mm (H)
	Weight:	Approx. 6.9 kg (printer body)

With Optional Automatic Sheetfeeder Installed

BIN 1 only:	Size:	458 mm (W)×378 mm (D)×364 mm (H)
	Weight:	Approx. 8.6 kg
BIN 1 & BIN 2:	Size:	458 mm (W)×442 mm (D)×369 mm (H)
	Weight:	Approx. 9.6 kg

(2) BJ-330 (136-column)

BJ-330 specifications are the same as BJ-300 except for the following items.

Maximum Number of Characters per Line:

Pitch	Maximum Number of Characters
10 CPI	136 CPL
12 CPI	163 CPL
15 CPI	204 CPL
17 CPI (10 CPI Condensed)	233 CPL
20 CPI (12 CPI Condensed)	272 CPL
Proportional	Varies
Proportional Condensed	Varies

(CPI: characters per inch; CPL: characters per line)

Paper Handling: Paper Type: Plain paper

For Cut Sheets:

	Width	Length	Weight
Manual Loading	90 to 431.8 mm (3.5" to 17")	90 to 594 mm (3.5" to 23.4")	52 to 128 g/m²
Automatic Sheetfeeder	148 to 364 mm (5.8" to 14.3")	90 to 364 mm (3.5" to 14.3") (BIN 1) 182 to 364 mm (7.2" to 14.3") (BIN 2)	60 to 90 g/m²

Envelopes: Commercial number 10 envelopes can be loaded in the front opening or BIN 1.

For Fan Fold Paper:

	Width:	101.6 to 406.4 mm (4" to 16")
	Weight:	52 to 90 g/m^2

Physical Dimensions:	Size:	592 mm (W)×333 mm (D)×137 mm (H)
	Weight:	Approx. 8.8 kg (printer body)

With Optional Automatic Sheet Feeder Installed

BIN 1 only:	Size:	592 mm (W)×378 mm (D)×364 mm (H)
	Weight:	Approx. 11.1 kg
BIN 1 & BIN 2:	Size:	592 mm (W)×442 mm (D)×369 mm (H)
	Weight:	Approx. 12.4 kg

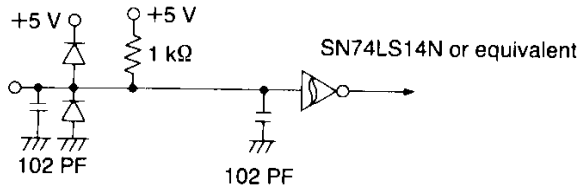
2. Interface Specifications

Data transmission method: 8-bit parallel interface (IBM PC compatible)

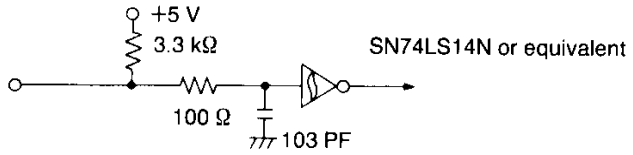
Signal levels:
Low: 0.0 V to +0.4 V
High: +2.4 V to +5.0 V

Input circuit:

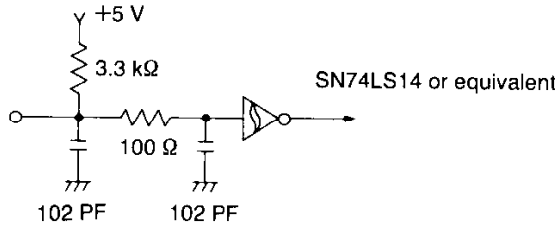
$\overline{\text{STROBE}}$



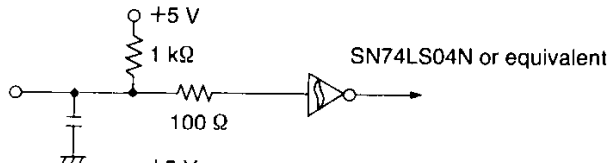
$\overline{\text{AUTO FEEDXT}}$



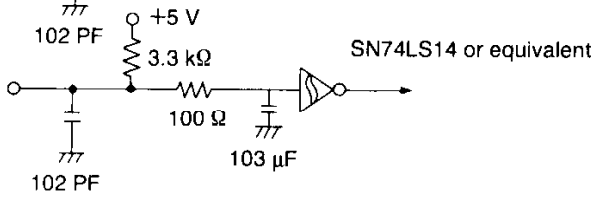
SLCT IN



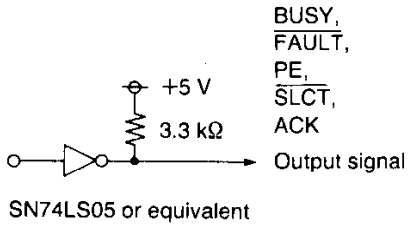
DATA



$\overline{\text{INIT}}$



Output circuit:



Interface cable:
Material: AWG No. 28 or more
Length: Up to 2.0 m (twisted pair shielded cable)

Interface connectors:
Printer side: Amphenol 57-40360 (or equivalent)
Cable side: Amphenol 57-30360 (or equivalent)

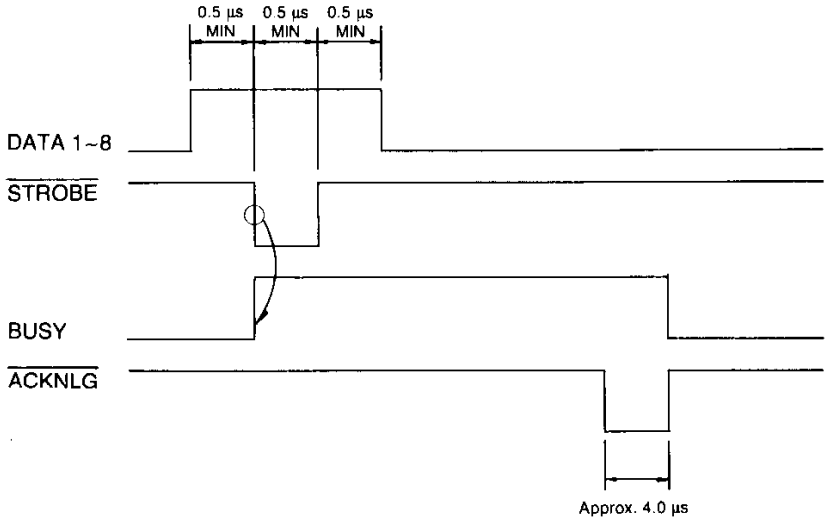
Note: For the specifications of the optional Serial Interface, see the user's manual for the Interface.

Pin Assignments

No.	Signal	I/O	No.	Signal	I/O
1	$\overline{\text{STROBE}}$	IN	19	$\overline{\text{STROBE}}$ -RET	
2	DATA 1		IN	20DATA 1 -RET	
3	DATA 2	IN	21	DATA 2 -RET	
4	DATA 3	IN	22	DATA 3 -RET	
5	DATA 4	IN	23	DATA 4 -RET	
6	DATA 5	IN	24	DATA 5 -RET	
7	DATA 6	IN	25	DATA 6 -RET	
8	DATA 7	IN	26	DATA 7 -RET	
9	DATA 8	IN	27	DATA 7 -RET	
10	$\overline{\text{ACKNLG}}$	OUT	28	$\overline{\text{ACKNLG}}$ -RET	
11	BUSY	OUT	29	BUSY -RET	
12	PE	OUT	30	PE -RET	
13	SELECT	OUT	31	$\overline{\text{INIT}}$	IN
14	$\overline{\text{Auto Feed XT}}$		32	ERROR	OUT
15	N.C		33	GND	
16	GND		34	N.C	
17	N.C		35	+5.0 V (3.3 kΩ pull up)	
18	N.C		36	$\overline{\text{SLCT-IN}}$	

*1. All -RETs are connected to GND.
*2. N.C means no connection.
*3. The level is raised to +5.0 V at 5.6 kΩ.

Timing Chart



Part VII — Appendices

A. Specifications of Recommended Paper VII-1
B. Printing Area VII-2
C. Transportation and Storage VII-4

A. Specifications of Recommended Paper

This section gives the specifications of recommended paper and envelopes in order to assure maximum print quality and reliable printer operation. Paper not conforming to these specifications may be used in the printer, however, the results cannot be guaranteed. Although the printer can print on most types of plain bond paper, always make a test print to ensure that results are satisfactory, because paper can be affected by temperature and humidity during storage. Also, some types of paper have a specific side for printing. Be aware of this when loading the paper.

(1) Paper Quality

Plain bond, typewriter quality paper without curls, folds, or damaged edges

(2) Paper Weight

Cut Sheet (Manual loading from front opening): 60 g/m^2 to 128 g/m^2 (16 lb to 34 lb)
Cut Sheet (from Automatic Sheetfeeder): 60 g/m^2 to 90 g/m^2 (16 lb to 24 lb)
Fan Fold: 52 g/m^2 to 90 g/m^2 (14 lb to 24 lb)

(3) Notes for Envelopes

Commercial number-10 envelopes are recommended. The following cannot be used.
— Envelopes with: windows, holes, perforations, cutouts, and double flaps.
— Envelopes made of specially coated paper, embossed paper or recycled paper.
— Envelopes with peel-off sealing strips.
— Envelopes with letters inside.
— Irregular Envelopes.

(4) Paper Storage Recommendations

Store at 18 to 24°C (64 to 75°F) and 40 to 60 % relative humidity.

B. Printing Area

1. Cut Sheets

(1) The left and right margin (A) is as follows.

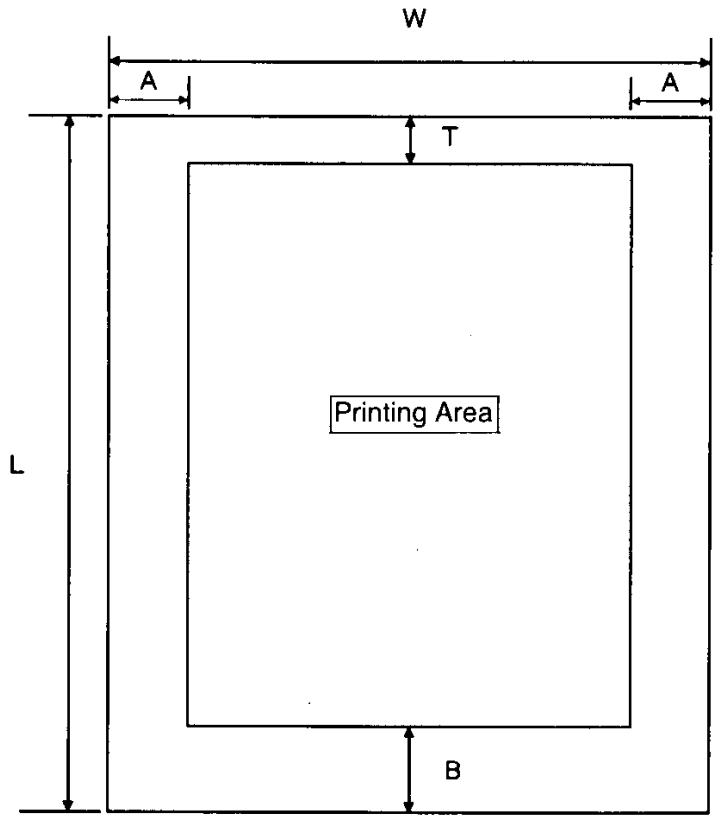
Portrait Orientation	B5/A4:	3.4 mm (0.13″)
	Letter:	6.4 mm (0.25″)
Landscape Orientation	B4/B5:	9.3 mm (0.37″)
	A3:	37.3 mm (1.47″)

(2) The recommended top margin (T) is 12.7 (0.5″) mm or more. If Emulation Mode 1 is selected, the printer is capable of printing when T=0 mm, but the print quality results are not guaranteed. If Emulation Mode 2 is selected, the printer is capable of printing when T=4.23 mm (1/6″), but the print quality results are not guaranteed.

(3) The recommended bottom margin (B) is 25.4 (1″) mm or more. The printer is capable of printing when B=12.7 (0.5″) mm, but the print quality results are not guaranteed.

Note: 1. Multipart paper cannot be used.
2. Paper length (L) and width (W) differ according to paper size and the printer's paper handling capabilities (see paper handling specifications in Part 6).

Printing Format:



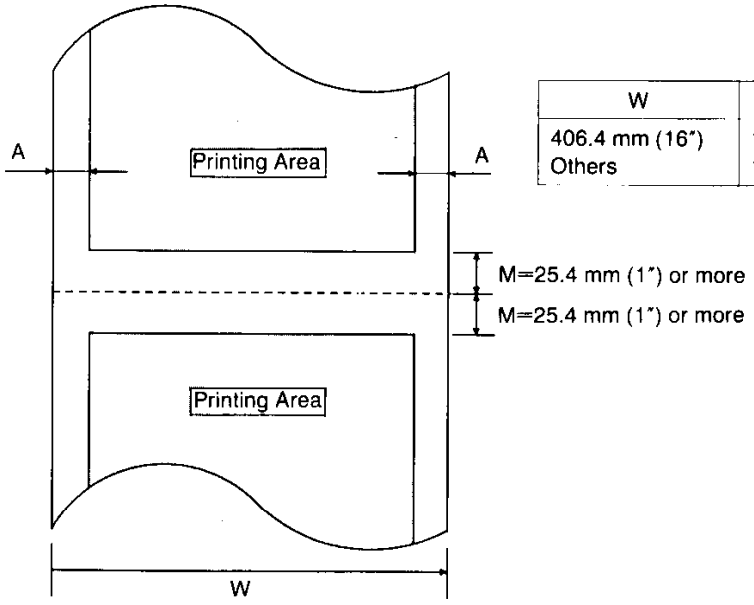
Paper Size	A (Minimum)
B5/A4	3.4 mm (0.13″)
Letter	6.4 mm (0.25″)
B4	9.3 mm (0.37″)
A3	37.3 mm (1.47″)

2. Fan Fold Paper

(1) The form length (L) must be a multiple of 25.4 mm (1″).
Maximum length is 6477 mm (255″).
(2) The top and bottom margin (M) should be more than 25.4 mm (1″) on each side of the perforation in order to avoid printing on the perforation.
(3) The left and right margins (A) should be 12.7 mm (0.5″) or more with 406.4 mm (16″) wide paper. (This side fits the BJ-330 only.) Other fan fold paper should have a left margin of 16 mm. (0.63″) minimum.

Note: Multipart forms cannot be used.

Printing Format:

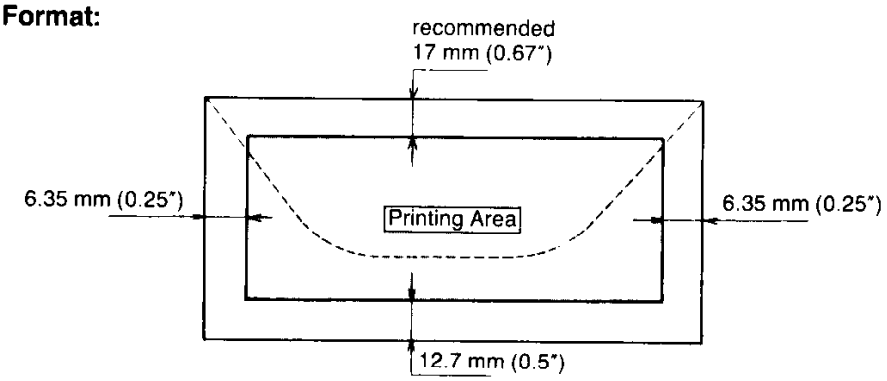


W	A (Minimum)
406.4 mm (16″)	12.7 mm (0.5″)
Others	16 mm (0.63″)

3. Envelope

(1) Commercial number-10 envelopes are recommended.
(2) The recommended top margin (T) is 17 mm (0.67″) or more. The printer is capable of printing when T=6.35 mm (0.25″), but the print quality results are not guaranteed.
(3) The minimum bottom margin is 12.7 mm (0.5″).
(4) The left and right margins should be 6.35 mm (0.25″) or more.

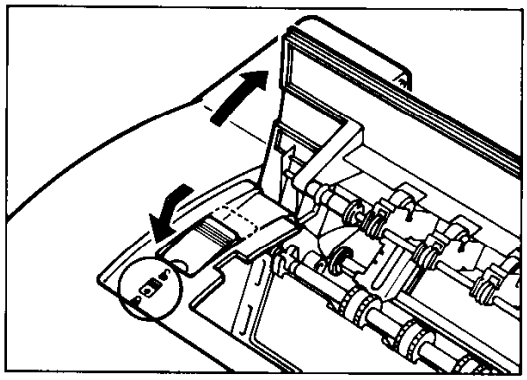
Printing Format:



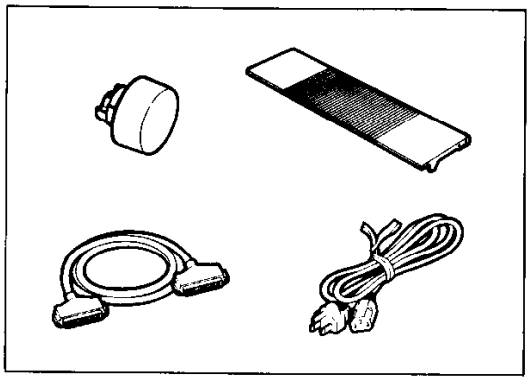
C. Transportation and Storage

When you transport your printer or store it for over one month, you should protect the print mechanism by following the procedure below.

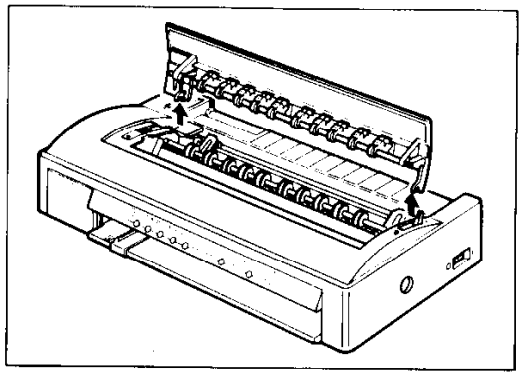
1 The print head must be placed in the carriage lock position. Remove all paper, then turn the power switch off. Press the LOCK OUT, PITCH and FONT keys at the same time and hold them down while turning the power on. The print head will move to the carriage-lock position and all the lights will blink.

2 

Open the front cover and lock the print head lock, then turn the power off.

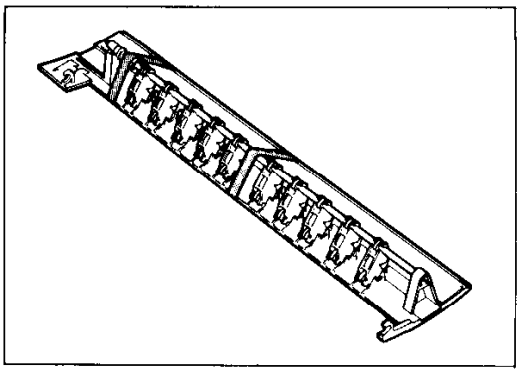
3 

Remove all cables, options,and the Paper Discharge Knob.

4 

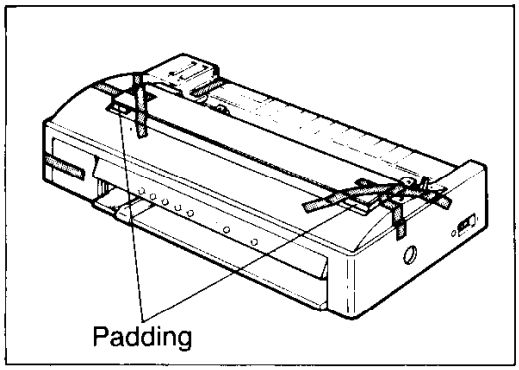
Remove the front cover.

5



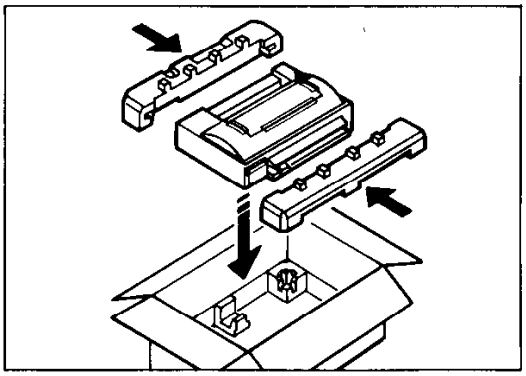
Secure front cover shaft with tape, as shown.

6



Place some padding between the front cover and the printer, then secure the front cover with tape.

7



Place the printer, connection cables, and Paper Discharge Knob in their original carton, making sure they are well cushioned with shock absorbent materials.

Index

A

Acoustic noise level I-1
Automatic sheetfeeder II-10, III-14

B

Base function mode III-2
BIN 1/BIN 2 ..... II-12
Bubble jet printing system I-1

C

CARD A light III-4
CARD B light III-4
CARD key III-3
Character printing test III-18
CLEANING key III-5
CLEANING light III-5
Cleaning the printer IV-4
Code page II-8
Control panel III-2
Control panel operations III-1
Customizing the printer II-6
Cut sheet paper guide III-8

D

DIP switches II-6
DIP switch labels II-1
Draft print quality III-4

E

Emulation mode 1 ..... II-8
Emulation mode 2 ..... II-9
Error detection function V-2

F

Fan fold paper holders III-11
Font cards I-3
FONT key III-3
FONT lights III-4
Front opening III-8

G

Gear cover II-3

H

Hardware specifications VI-1
Heating element I-1
Hexadecimal dump function III-19
High quality print mode III-4
High speed print mode III-4

I

Ink cartridge IV-1
INK light III-5
Ink sensor IV-2
Installation requirements I-4
Installing paper III-6
Interface specifications VI-4

L

Letter print quality III-4
LF/FF key III-3
LOAD/EJECT key III-7
LOCK OUT key III-5
LOCK OUT light III-5

M

Micro adjust mode III-7
MICRO DOWN key III-7
MICRO UP key III-7

O

Off line III-1
On line III-1
ON LINE key III-3
ON LINE light III-3
Operating and storing environment I-5

P

Panel overlays II-1
Paper delivery tray II-12
Paper discharge knob II-3
Paper jams V-3
PAPER key III-6
PAPER lights III-5
Paper selection lever III-6
Paper specifications VII-1
Paper support II-13
Paper width sensor III-8
Parallel interface II-5
Parking fan fold paper III-17
Pinfeed wheels III-6
Pinfeed wheel-locking levers III-6
PITCH key III-4
PITCH lights III-5
Power cord II-1
POWER light III-3
Power supply I-4
Printer/computer connection II-5
Print head cleaning V-1
Print head lock II-4
Printing area VII-2

R

Rear panel cover II-14
Reset function III-5
Ripple pattern printing test III-18

S

Separator III-13
Serial interface board II-13
Shift function mode III-2
SHIFT key III-3
SHIFT light III-3

T

Transportation and storage VII-4
Troubleshooting V-1

1. PRODUCT LINE

1.1 OVERVIEW OF COMPONENTS

This section outlines the printer set, options, and consumable.

1.1.1 PRINTER SET

a) Printer

This is a desk top type, 136-column printer, and compatible with the IBM Proprinter XL24E mode and Epson LQ-1050 mode.

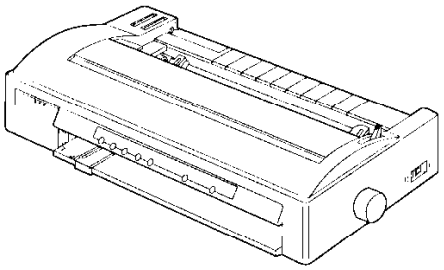


Figure 3-1 Printer

b) Ink cartridge

With this ink cartridge of about 40g black ink, about a million characters (666 pages in A4 size) can be printed in the HQ mode.

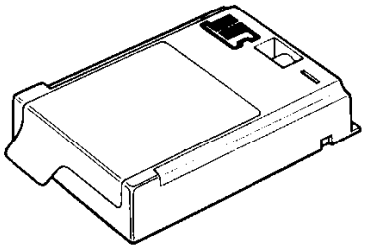


Figure 3-2 Ink Cartridge

c) User's Manual

The User's Manual explains how to use the printer. It describes how to operate the printer, and a list of software commands.

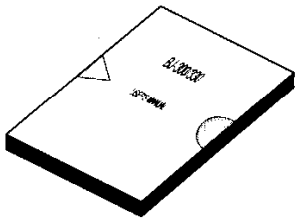


Figure 3-3 User's Manual

d) Programmer's Manual

The Programmer's Manual explains how to use software commands.

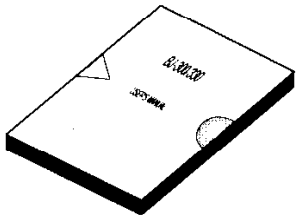


Figure 3-4 Programmer's Manual

1.1.2 OPTIONS

a) Serial interface board

The interface board can be fitted to the printer to be able to print characters by inputting serial data.
By changing the switch, 2 modes (RS232C and RS422) can be selected.

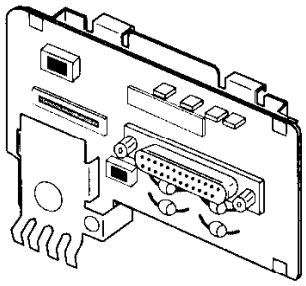


Figure 3-5 Serial Interface Board

b) BIN 1 auto sheet feeder

The auto sheet feeder can be fitted to the printer to automatically feed a cut sheet from its tray to the printer. The sizes of paper that can be automatically fed are envelopes to B4R. About 100 sheets can be placed on the tray.

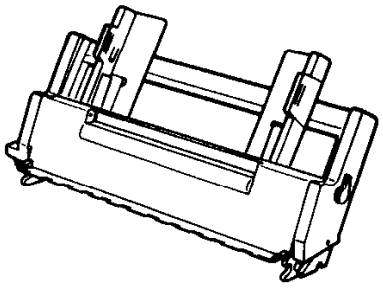


Figure 3-6 1st Bin Auto Sheet Feeder

c) BIN 2 auto sheet feeder

The auto sheet feeder can be fitted to the rear of the BIN 1 auto sheet feeder to automatically feed a cut sheet from its tray to the printer. The sizes of paper that can be automatically fed are B5 to A4R. About 100 sheets can be placed on the tray.

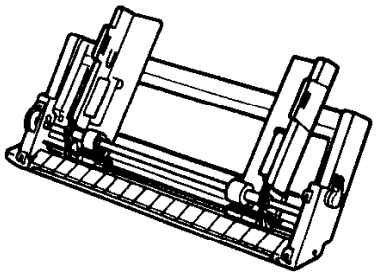


Figure 3-7 2nd Bin Auto Sheet Feeder

d) Font card

The font card can be fitted to the printer to expand its capable font in addition to the 3 types resident fonts.

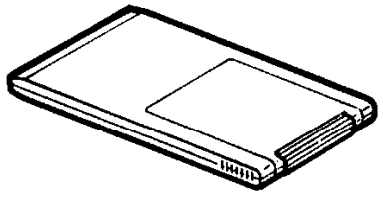


Figure 3-8 Font Card

1.1.3 CONSUMABLE

a) Ink cartridge

As a consumable, ink cartridge is the same as that supplied with the printer except for the package.

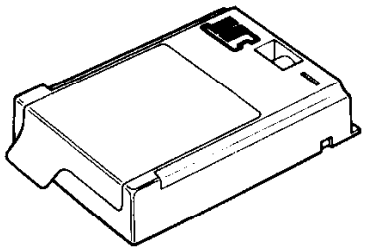


Figure 3-9 Ink Cartridge

2. OVERVIEW OF PRINTER

This section describes the features of the printer.

a) High-speed, High-resolution and Low noise level

- Data is printed at 300 characters per second (HS mode) with a low noise level of 45 dB(A) with a resolution of 360 dots per inch on regular office paper and envelopes.

b) Software compatible

- The printer has two types of software compatible mode; IBM Proprinter XL24E mode and Epson LQ-1050 mode.

c) Paper feeding

- Cut sheets, envelopes and postcards can be fed manually from the front paper slot.
- Fan fold paper can be fed from the rear paper slot by using pin feed.
- With optional auto sheet feeder, cut sheets, envelopes and post cards can be fed automatically.

d) Various options

3. PRINTER SPECIFICATIONS

For the printer specifications, see 4. USER'S MANUAL in *Part 2: Operating Instructions* of this manual.

- For details of hardware specifications, see page VI-1 of the User's Manual.
- For details of interface specifications, see page VI-4 of the User's Manual.
- For details of the specifications of print paper , see page VII-1 of the User's Manual.

4. PRINTER MECHANISMS

4.1 BUBBLE JET HEAD

4.1.1 BUBBLE JET HEAD

The printing head uses the bubble jet printing head including the driver which has the 64 bubble jet nozzles in a line and a resolution of 360 DPI.

NOTE The bubble jet printing system is a non-impact, low noise printing system that heats the ink into bubbles by flowing current through heating elements in thin nozzles filled with ink, then jetting the ink from the nozzles onto printing paper.

4.1.2 BUBBLE JET HEAD STRUCTURE

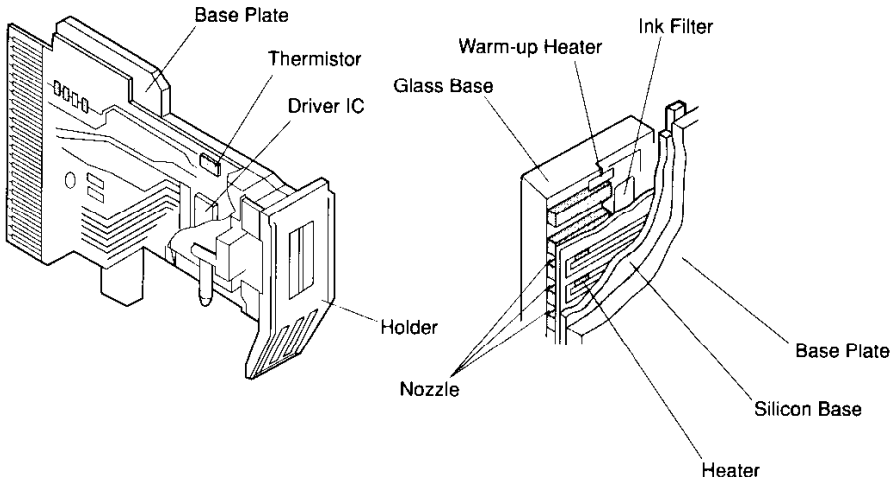


Figure 3-10 Bubble Jet Head

a) Bubble jet nozzles

The ink passes through the meshed ink filter to remove dust, and is flowed to the bubble jet nozzles through the joint pipe. When the head drive current flows through the heater plate of a nozzle, the ink boils and bubbles are produced, forming into one large bubble. The head drive current is cut off before a drop of ink is ejected from the nozzle, but bubbling is grown because of the remaining heat on the heater, and the drop of ink is ejected from the nozzle at about 7 m/s. After ejected the drop of inks, the nozzle is refilled with ink.

NOTE The bubble jet head is formed on the silicon plate based on semiconductor technology.
The heater and its electrical wiring are formed on the plate.
A photosensitive resin layer (nozzle wall) and glass top cover are bonded to the plate, and nozzles are made in the photosensitive resin layer by a laser.

b) Nozzle arrangement

The 64 bubble jet nozzles are arranged in a line at intervals of 1/360 inch. The upper 60 nozzles are used for actual printing.

c) Printing data transmission and reception

A bubble jet printer, with fewer nozzles, transfers printing data in parallel from a control unit to a print head, with one signal line per nozzle. Since the print head of this printer has 64 nozzles, printing data cannot be transferred to the print head in parallel.

This printer converts printing data to serial data with a gate array on a logic board, then transfers it to the bubble jet head via 23 signal lines (flexible cables) and a carriage board. The driver IC, a shift transistor, in the bubble jet head, converts the serial data to the parallel data for 64 nozzles, then prints it.

d) Printing data interface

Printing data is transferred from a logic board to the bubble jet head eight times in 8-bit units in synchrony with 2.5 MHz clock pulses.

The printing data transferred to the bubble jet head is latched with a data latch pulse, and all the nozzles are divided into four nonoverlapping groups, (4n+1), (4n+2), (4n+3), and (4n+4) (n=0-15) for heating. This reduces the load on the power supply unit and reduces its size.

Since data is latched after the shift register, the previously transferred data is used for heating.

e) Heater heat pulse

The heater drive control for determining the ink jet speed keeps the heat voltage constant and automatically selects the optimum heat level of the 11 levels for the logic board to compensate for manufacturing variations of the bubble jet heads.

The heat timing is based on the 180 DPI pitch output in the carriage motor encoder, and a 360 DPI heat signal is generated by the gate array on the logic board.

f) Temperature control

The bubble jet head unit has temperature sensors and warm-up heaters on the silicon plate. The printer determines the bubble jet head temperature detected by the temperature sensor in the bubble jet head. When it detects lower than 80°F (32°C)except when capping, the bubble jet head unit nozzles are warmed by the warm-up heaters.

When it detects upper than 108°F (80°C) or lower than 18°F (-30°C), head driving pulse and warm up heater are stationary. The temperature sensor on the carriage board determines the ambient temperture around the head which is used by controlling the head maintenance mobility.

4.2 INK PASSAGE

Outline

Ink is supplied from an ink cartridge to the bubble jet head when the purge unit cleans the ink path. The waste ink from the purge unit pump is absorbed into the ink absorber in the ink cartridge.

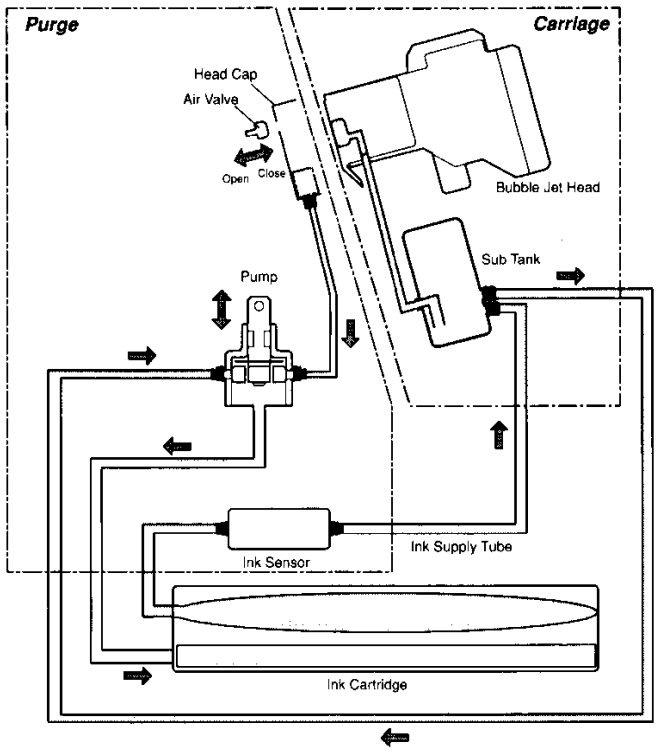


Figure 3-11 Ink Passage

a) Ink sensor

The ink sensor is a pressure sensor having a diaphragm switch.
When the ink in the ink cartridge is low, the pressure in the ink tube decreases, and this is detected by the ink sensor.

b) Subtank

The subtank on the carriage is an ink buffer that stores a certain quantity of ink and provides a stable ink supply to the bubble jet head that moves horizontally with the carriage.

c) Air valve

The air valve is opened and closed by the purge pump gear in the purge unit. The air valve is opened before the cap is opened to suck the remaining ink in the cap into the pump and fill the cap with air.

d) Cap

The cap is moved forward and backward when it slides with the carriage. The cap covers all the nozzles of the print head when it moves forward.

e) Pump

The pump is run by the purge unit purge pump gear. When ink is supplied or maintenance is performed, the pump sucks ink from the nozzles of the bubble jet head and discharges waste ink to the ink cartridge.

4.3 PURGE UNIT

4.3.1 PURGE UNIT FUNCTIONS

The purge unit, driven by the paper feed motor, maintains the bubble jet nozzles to keep high quality printing.

a) Capping function

When printing does not take place for more than twelve seconds, the capping function pushes the rubber cap of the purge unit against the face plate (nozzle part) of the bubble jet head to prevent the ink from drying up or leaking.

b) Cleaning function

To maintain high quality printing with the bubble jet head, the cleaning function is performed at the state of the power being on or the handling of the operator panel. For cleaning, a wiping operation takes place to wipe off paper fiber and ink remaining on the face plate of the bubble jet head, and a pumping operation takes place to suck ink from the capped bubble jet head and fill the nozzles with fresh ink, or remove stains from the heat plate.

4.3.2 PURGE UNIT STRUCTURE

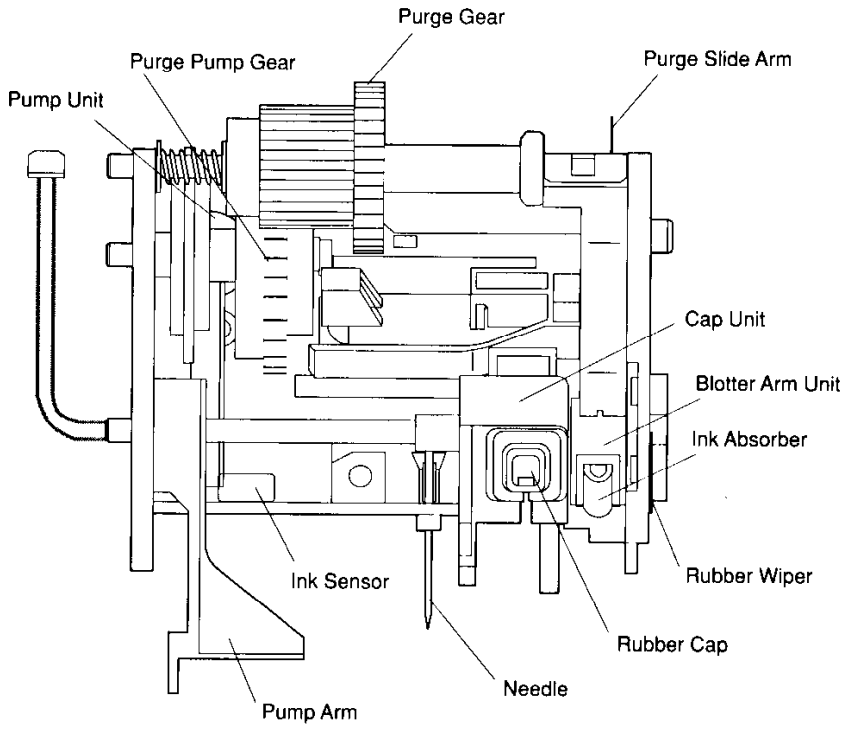


Figure 3-12 Purge Unit

a) Purge slide arm

The purge slide arm is a transmitting arm for moving the slide gear by the cap that is slid by the carriage driven by the carriage motor and for converting the power from the paper feed gear to power for the purge unit, auto sheet feeder, and paper feed rollers.

b) Purge pump gear

The purge pump gear is driven by the paper feed gear to drive the purge unit pump. The purge pump gear rotation is controlled by sensing the movement of the pump arm by the purge pump gear with an HP sensor on the carriage.

c) Pump arm

The pump arm is a sensor flag that senses the purge pump gear rotation with an HP sensor (photosensor).

d) Rubber wiper

The rubber wiper wipes ink and paper fiber from the face plate during cleaning when the carriage moves horizontally before the rubber wiper.

e) Blotter arm unit

The blotter arm unit has an ink absorber. The ink absorber wipes off the ink which is not removed by the wiper during cleaning on the face plate of the bubble jet head

f) Cap unit

The cap arm with its rubber cap advances with the operation of the carriage and caps the bubble jet head. The rubber cap connects to the ink pump and sucks ink from the bubble jet head during cleaning. The air valve which operates opening and closing movement with purge pump gear is also included in the cap unit.

g) Pump unit

The pump unit sucks ink through the rubber cap and the sub tank to maintain the level and runs it to the waste ink absorber in the ink cartridge.

4.4 INK CARTRIDGE

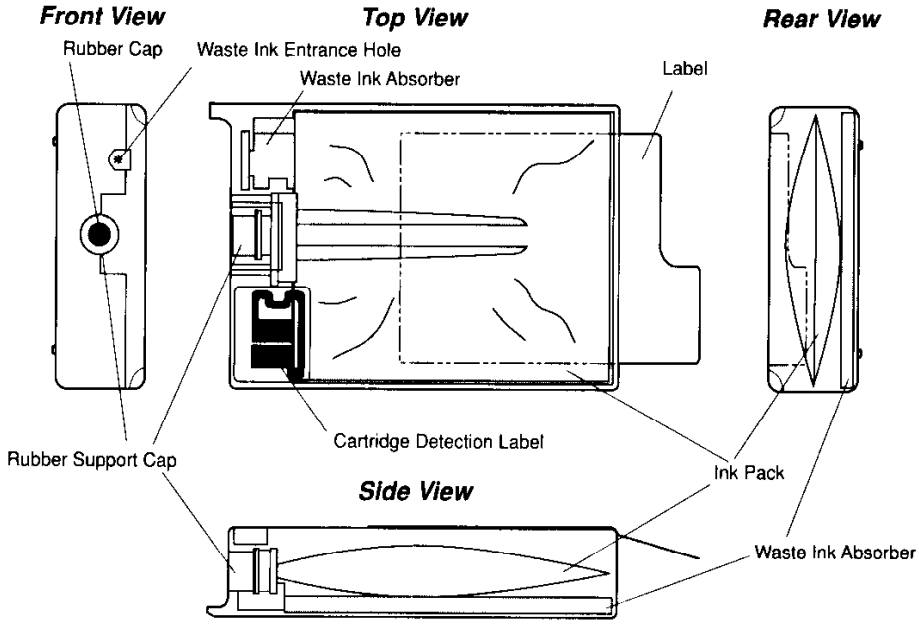


Figure 3-13 Ink Cartridge

The ink cartridge contains an aluminum laminate pack filled with about 40 ml of ink and an ink absorber in a plastic case to suck the waste ink.
After the ink cartridge is changed, the printer automatically detects whether there is an ink cartridge and ink.

Ink cartridge detection
The ink cartridge is always detected by the ink cartridge sensor while the printer power is turned on.
The ink cartridge sensor detects an ink cartridge by touching the cartridge detection label unit of ink cartridge.

Ink detection
Ink is detected by the ink sensor of the purge unit after cleaning and maintenance jet. When ink is lacking, printing stops, and an error is indicated on the operator panel.

Never try to disassemble or refill ink cartridges.

4.5 CARRIAGE SECTION

4.5.1 CARRIAGE SECTION FUNCTIONS

The carriage driven by the carriage motor performs a logical seek operation horizontally over the print paper.
A bubble jet head having a resolution of 360 DPI and 64 nozzles is mounted on the carriage section.
The logic board and the bubble jet head mounted on the carriage are connected by a flat cable.

4.5.2 CARRIAGE SECTION

a) Carriage drive section

The carriage is moved horizontally over the print paper by the carriage belt that transmits the power of the carriage drive motor. The carriage position and speed are detected by the output from the encoder in the carriage drive motor after the photocoupler type home position sensor on the bottom of the carriage detects the photointerrupter at the home position.
The carriage drive motor has two modes: stepping motor type and DC motor type. This motor operates as a stepping motor type if a high torque is necessary to change the slide gear, perform cleaning, etc. It operates as a DC motor type during printing to reduce noise.

b) Paper feed motor switching section

The carriage driven by the carriage drive motor slides the cap unit and converts the power of the paper feed gear to power for the purge unit, auto sheet feeder, and paper feed via the slide gear.

4.6 PAPER FEED SECTION

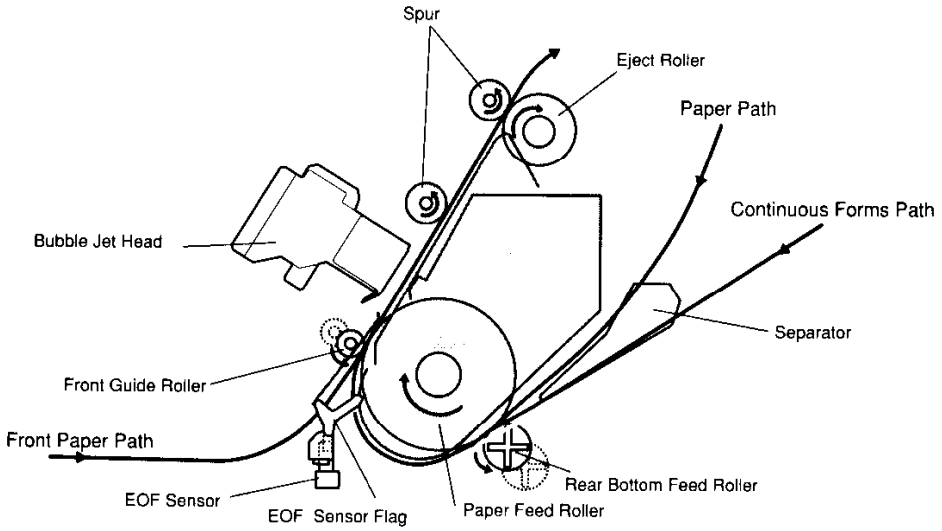


Figure 3-14 Paper Passage

4.6.1 PAPER FEED SECTION FUNCTIONS

The paper feed section driven by the paper feed motor rotates the feed roller and feeds or retracts the print paper vertically.

Cut sheets can be loaded, not only from the rear of the printer, but also from the front of the printer or from an optional cut sheet feeder.

Fan fold paper is fed from the rear of the printer by a pin feed tractor. Do not feed fan fold paper manually with the paper feed knob or the microadjust setting becomes improper. Always use the control keys except when a jammed paper is removed.

4.6.2 PAPER END DETECTION SECTION

A photocoupler type EOF (end of form) sensor is an actuator that works as an interrupter and detects the leading and trailing edges of the print paper.

When fan fold paper is selected, the paper end detection section detects whether there is print paper according to the information from the EOF sensor. When cut sheets are selected, the paper end detection section detects whether there is print paper and whether there is any error, such as paper jam, according to the information from the EOF sensor and the amount of paper feed.

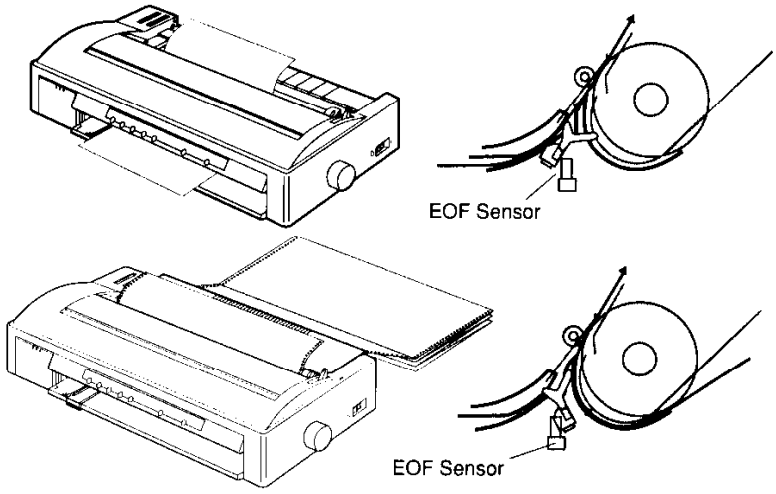


Figure 3-15 EOF sensor

5. OUTLINE OF ELECTRICAL SYSTEM

The electrical system can be functionally divided into a control logic unit and a power supply unit. The control logic unit, consisting of a logic board and a carriage board, monitors the states of the sensors in the printer and controls the bubble jet head and actuators, such as motors, to print data from a personal computer. The power supply unit converts AC power to DC power for the control logic unit.

5.1 BLOCK DIAGRAM

A block diagram of the electrical system is shown below.

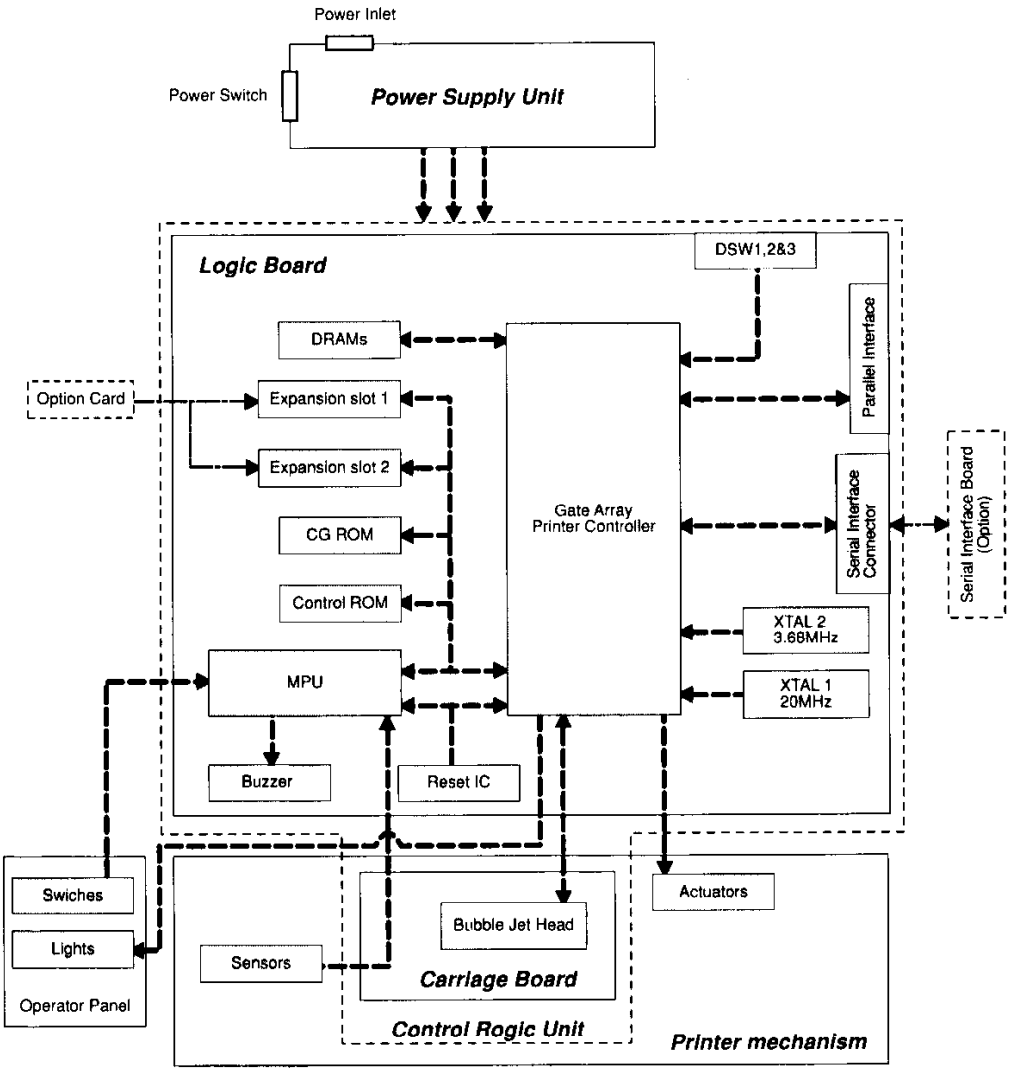


Figure 3-16 Block Diagram

5.2 CONTROL LOGIC UNIT

The control logic unit consists of a logic board that controls all printer operations and a carriage board that links the bubble jet head and logic board.

5.2.1 LOGIC BOARD

a) Logic board functions

The logic board has the following functions:

1) Printer control

The logic board controls the printer logically with the paper feed stepping motor and a carriage motor that functions as a stepping motor type or a DC motor type according to the printer states detected by the EOF sensor, HP sensor, paper width sensor, and paper select sensor.

2) Interface

The logic board converts data from the computer via the parallel interface connector or an optional serial interface connector to printing data and printer control commands to control printer operations.

3) Printing data control function

The logic board controls the printer operations by converting printing data into printing signals for the bubble jet head.

4) Motor drive functions

The logic board controls the paper feed motor that drives the paper feed, purge unit, and an optional auto sheet feeder, and a carriage drive motor that drives the paper feed motor and carriage.

5) Switching

The logic board detects the states of control keys and functions selectors.

5.2.2 LOGIC BOARD COMPONENTS

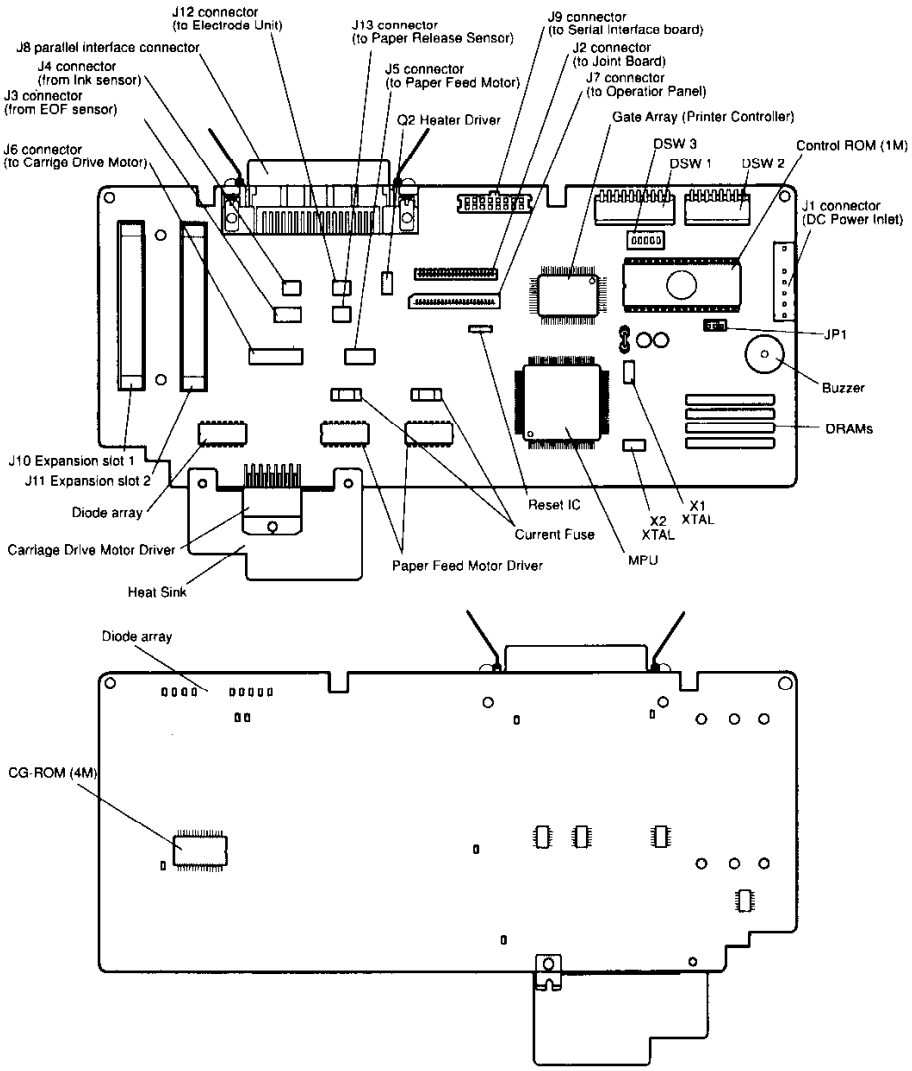


Figure 3-17 Logic Board

a) MPU (Microprocessor)

The MPU (Mitsubishi M37700SAFP) contains an 16-bit CPU, a 512-Kbyte work RAM, timer, A/D converter, an 8-bit data bus port and PWM output ports which drives the carriage motor and is operated by 10MHz.

- The 16-bit CPU operates in synchrony with a 10 MHz external clock.
- The 24-bit address bus port is connected to the 1-Mbit control ROM, 4-Mbit CG-ROM and printer controller. The control ROM and CG-ROM are chip-selected by the printer controller in synchrony with the read/write signals output from the MPU and the 10 MHz clock.
- The 8-bit data bus port is connected to the 1-Mbit control ROM, 4-Mbit CG-ROM and printer controller same as address bus.
- The PWM (programmable width modulation) signal for driving the carriage drive motor is output to the printer controller, and the encoder slit signal from the carriage drive motor is input to the internal time counter via the printer controller to detect the position and speed of the carriage drive motor.
- The analog signals from the paper width sensor and head temperature monitoring thermistor are read via the internal A/D converter.

b) DRAMs

Four 64 Kbit × 4-zigzag inline package (ZIP) DRAMs having a 4-bit data input/output function and an 8-bit row address/column address input/output function are grouped into two blocks, each containing two DRAMs to produce two pseudo-DRAMs having an 8-bit data input/output function and an 8-bit row address/column address input/output function. These DRAMs (128 Kbytes) are used as a receive buffer or print buffer.

The refresh operation is controlled by the DRAM control circuit in the printer controller.

c) Control ROM

The control ROM is a 1-Mbit programmed EPROM having a 17-bit address input function and an 8-bit address output function to output the control program onto the 8-bit data bus of the MPU.

d) CG-ROM

The CG-ROM is a 4-Mbit CMOS mask programmed ROM having a 19-bit address input function and an 8-bit address output function to output character bit map data onto the 8-bit data bus of the MPU.

e) Reset IC

The low active reset pulse output from the reset IC is input to the MPU, gate array (printer controller), or IC card in the expansion slot to reset it when the power is switched on. When the IC card is inserted or removed, a reset pulse is output to prevent a system crash.

f) Gate array (printer controller)

The gate array is a flat package type custom IC having all the functions other than an MPU and memory functions. The major functions are as follows:

- Address decoding function
- Clock division function

  The input from crystal oscillator X1 that generates 20 MHz is divided into 10 MHz MPU input clock pulses and output. The input from crystal oscillator X2 is used to generate a baud rate when a serial interface is used.
- DRAM control function

  The refresh operation, RAS/CAS timing control, and read/write control of the four DRAMs, which make up two 8-bit pseudo-DRAMs, are controlled via their own independent buses.
- Interface control function

  There are a parallel interface function and a serial interface function.

  The parallel interface function receives 8-bit parallel data from the 36-pin parallel interface connector via one Schmitt trigger type inverter IC and two open collector type inverter ICs by the BUSY/-ACK handshaking of the personal computer and TTL level, and transmits the printer operating status over the status line.

  Refer to the manual of the optional serial interface for details about the serial data interface function.
- Head control function

  Printing data is converted to serial data, then transferred to the bubble jet head eight times in 8-bit units in synchrony with 2.5-MHz clock pulses.

  The printing data transferred to the bubble jet head is latched with a data latch pulse, and all the nozzles are divided into four nonoverlapping groups, (4n+1), (4n+2), (4n+3), and (4n+4) (n=0-15) for heating.

The heat signal is a 360 DPI pitch signal generated from the 180 DPI pitch output of the carriage motor encoder.

Motor control function

The motor control function excites the two-phase paper feed motor and drives the two-phase or single-phase carriage motor with the drive width signal from the MPU via the motor driver.

g) JP1

Jumper flag JP1 is set to suit the control ROM capacity. The 4-M type is reserved for future expansion.

5.2.3 CARRIAGE BOARD

a) Carriage board functions

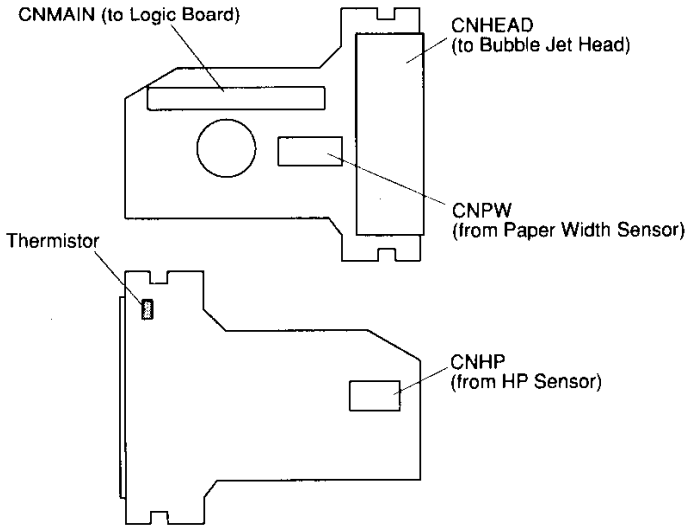


Figure 3-18 Carriage Board

b) Carriage board structure

The carriage board is mounted on the carriage and has connectors for connecting the bubble jet head, paper width sensor, and HP sensor; a thermistor for detecting the temperature around the head to perform head maintenance; and a capacitor for stabilizing the head voltage.

5.3 POWER SUPPLY UNIT

5.3.1 POWER SUPPLY UNIT FUNCTIONS

The power supply unit generates various DC voltages for the printer from the AC input.

5.3.2 POWER SUPPLY UNIT STRUCTURE

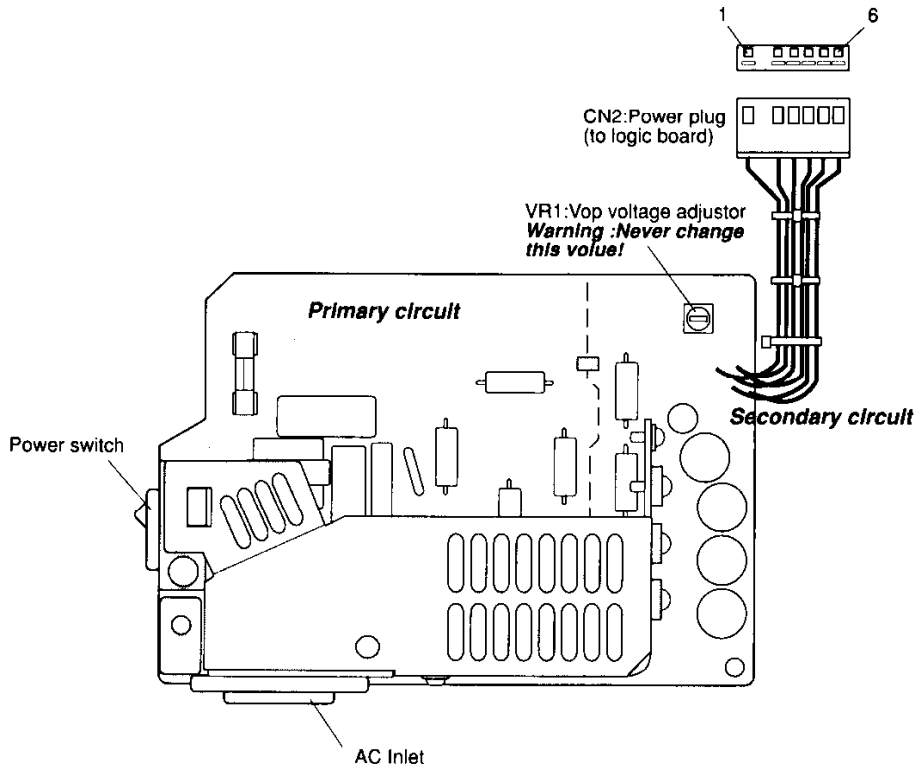


Figure 3-19 Power Supply Unit

- **CN1**

CN1 is an AC inlet having three terminals, including a ground terminal.

- **CN2**

CN2 is a plug for the secondary output of the power supply circuit. There are three voltages: Vcc voltage (5 VDC + 3%/– 5%) used for the logic drive voltage, Vop voltage (28 VDC ± 0.2 V) used for the heat voltage for the bubble jet head, and VM voltage (28 VDC ± 2 V) for the motor driver voltage. Overcurrent is prevented for each of the outputs.

- **VR1**

VR1 is a variable resistor that changes the Vop voltage value used as the heat voltage for the bubble jet head among the secondary outputs of the power supply circuit. It has been adjusted to the standard Vop value and paint-locked at the factory.
VR1 need not be readjusted even if the power supply unit is replaced for servicing.

When servicing the power supply unit with the power on, take special care to avoid electric shock.
Note that a primary voltage is present in the Q1 heat sink.

6. SENSOR & ACTUATOR

SENSOR & ACTUATOR

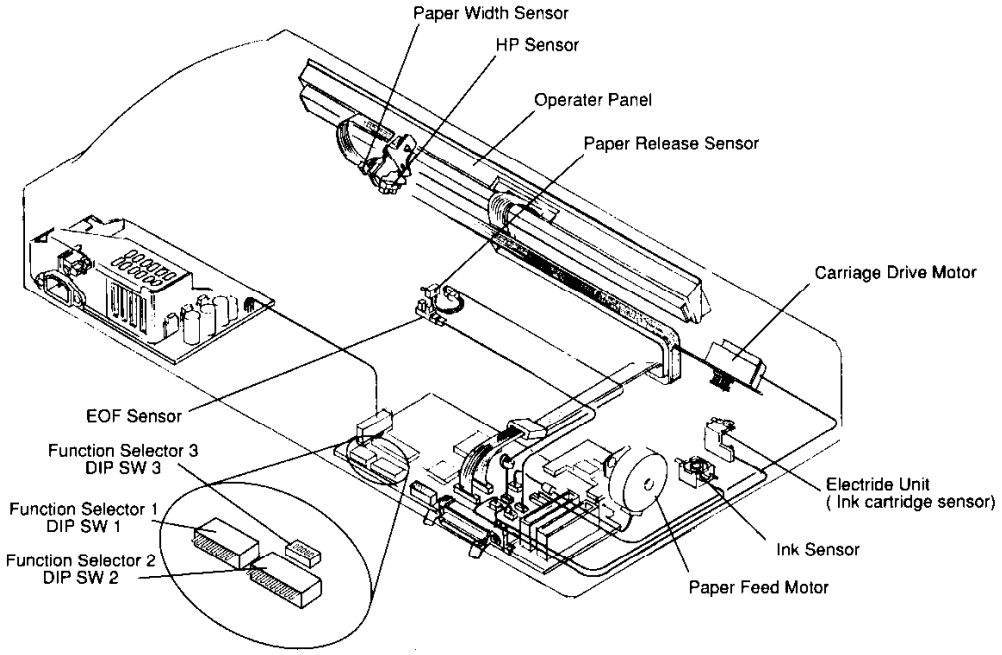


Figure 3-20 Sensor & Actuator Location

1. MAINTENANCE

1.1 PERIODICALLY-REPLACED PARTS

Level	Periodically-replaced part
User	None
Service engineer	None

1.2 CONSUMABLES

Level	Consumable
User	Ink cartridge
Service engineer	None

1.3 PERIODIC MAINTENANCE

Level	Periodic service
User	None
Service engineer	None

2. DISASSEMBLY AND ASSEMBLY

2.1 OUTLINE OF DISASSEMBLY AND ASSEMBLY

2.1.1 OUTLINE

Refer to the Parts Catalog for disassembling and assembling the printer. It contains illustrations showing the assembly procedures and describes the joint conditions for the plastic hooks and notches, which must be handled with care.
This chapter explains only how to remove the upper case, which is frequently removed, and the purge unit and carriage unit, which required special care.
The adjustment points and procedures are described in the next chapter.

2.1.2 REQUIRED TOOLS

Table 4-1 Tool List

Tool	Note
Phillips screwdriver	
Phillips screwdriver	
Tweezers	
Needle cap	QA2-0292-000
Grease	FLOIL G-311S

Lubricating positions
- All gears, Spur roller, Bushing assy other than in the guide roller unit, Gear shaft, Feed gear unit (Apply 0.1 to 0.2 g.)
- Carriage shaft (Apply 0.5 to 1.0 g.)

2.1.3 DISASSEMBLY AND ASSEMBLY PRECAUTIONS

Observe the following precautions when servicing the printer:

1) Protecting the power supply unit

If abnormal odor or smoke is emitted from the printer after the power is switched on, immediately switch the power off and determine the cause.

After switching the power on or off, wait at least 2 seconds before switching it on or off again.

When replacing parts, always switch the power off and disconnect the printer power cord.

Before handling the printed circuit board, touch a metal part of the printer to discharge static electricity from your body. This prevents damage to the printed circuit board.

Since the ink is conductive, it can cause a short circuit if it leaks in the printer. If a leak occurs, wipe up the ink thoroughly even under the IC chips.

2) Protecting the printer mechanisms

The printer mechanisms are fastened together with plastic hooks and notches, not screws. To protect these hooks and notches from deformation and damage, make sure that they are properly positioned.

The ink is a water base ink, but it contains an indelible dye, so it cannot be removed from clothing. When servicing the printer, take care not spill ink on the printer, the workbench, your body, or your clothing. When servicing the purge unit outside the printer, cover the ink needle with its cap.

3) Protecting the ink flow

Do not disassemble the purge nor carriage units beyond the descriptions in the Parts Catalog; otherwise, ink leakage and/or defective printing may result.

4) Protecting the bubble jet head

Never touch the nozzle of the bubble jet head or wipe it with tissue paper. The bubble jet head must not be disassembled, or washed with water.

5) Protecting the ink cartridge

Do not disassemble the ink cartridge; otherwise, ink leakage may result.

6) After reassembly

After reassembling the printer, check that all screws and washers have been replaced and that there are no loose connectors and so forth. Then, test it for normal operation. When carrying the printed circuit board, cover it with an aluminum sheet or place it in a static shielding bag. If the printer is transported, pack it according to the repacking procedure.

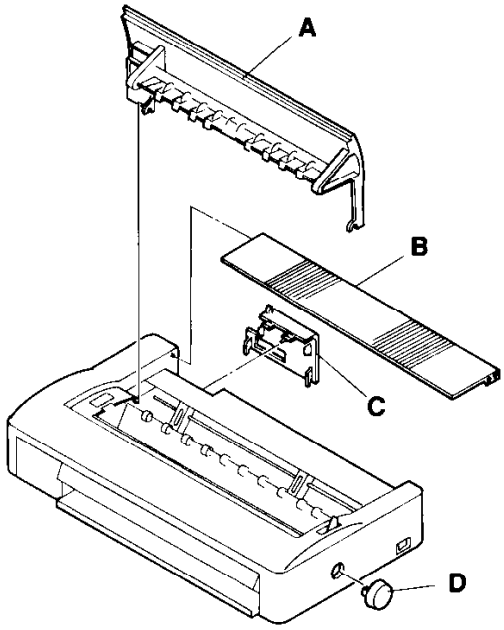
2.2 DISASSEMBLY PROCEDURES

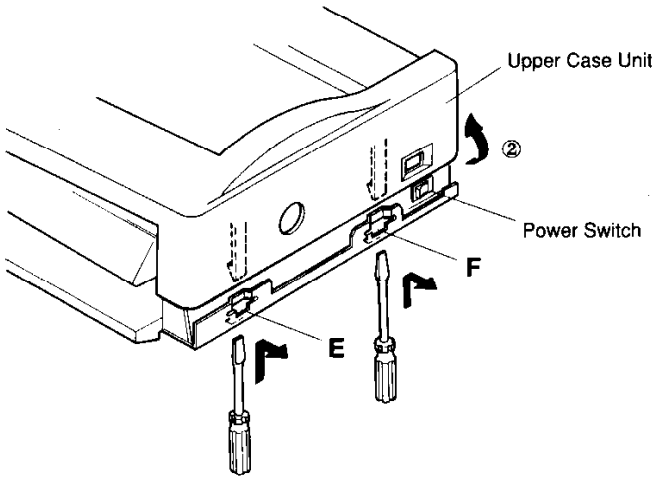
2.2.1 UPPER CASE UNIT

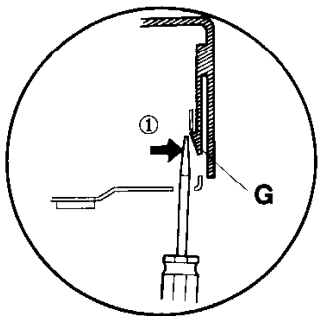
Preparations
Remove the power cord.
Unlock the carriage.

Procedures
1. Remove top cover A, continuous paper feed guide B, rear cover C, and knob D.
2. Insert a standard screwdriver into holes E and F, and unhook claws G by moving the screwdriver in the direction of arrow ①.
3. Move the upper case according to arrow ②, and hold it above the power switch.
4. Repeat step 3 for the opposite side.

To assemble the upper case, follow the disassembly procedure in reverse order. After assembly, press the case until it clicks in place.





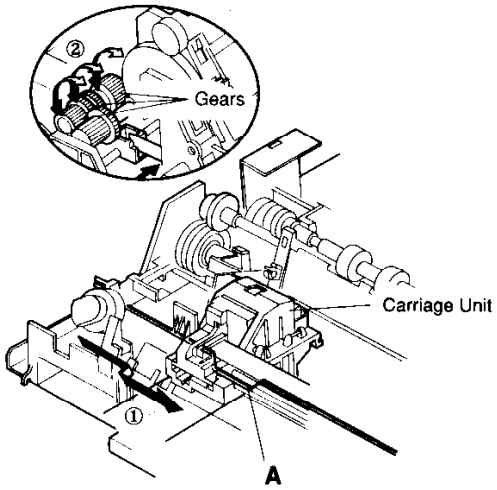


2.2.2 PURGE UNIT

Preparation
Remove the upper case unit.

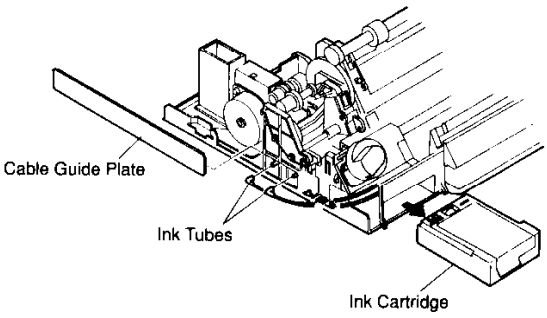
Procedures
1. According to arrow ①, slide the carriage unit to A.

   If the carriage unit does not move, turn the gears in the direction of arrow ② to move it.

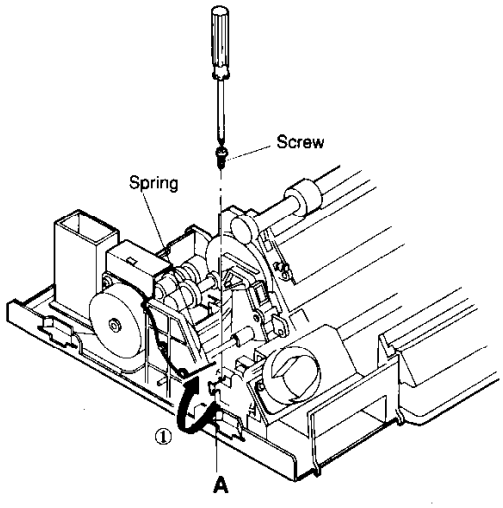


2. Remove the ink cartridge, the cable guide plate, and the ink tubes.

Always remove the ink cartridge when the purge unit is disassembled; otherwise, the ink needle may be damaged.

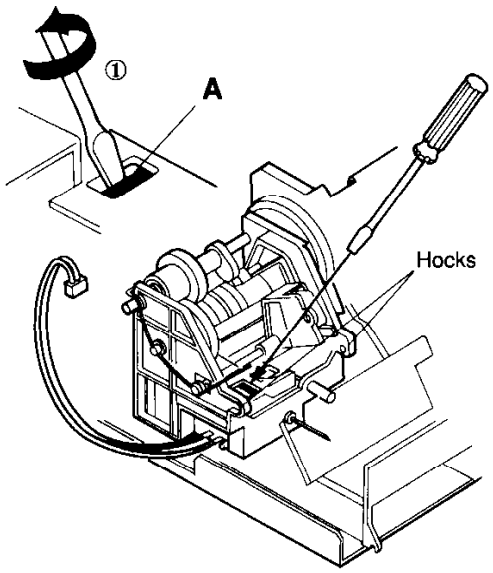


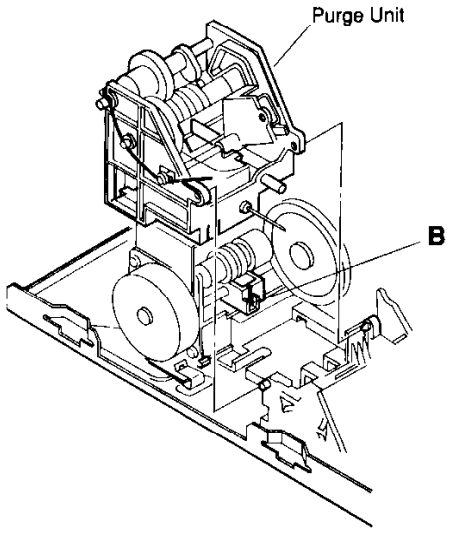
3. Move the spring according to arrow ① to remove it.
4. Remove the screw fastening the purge unit.



3. Move the spring according to arrow ① to remove it.
4. Remove the screw fastening the purge unit.

5. Insert a standard screwdriver into A and turn it 180 degrees in the direction of arrow ①. (The purge unit is disconnected from the fastening hooks.)
6. Holding D by hand, remove the purge unit with B passing between the gears.



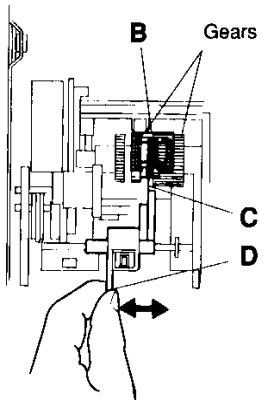


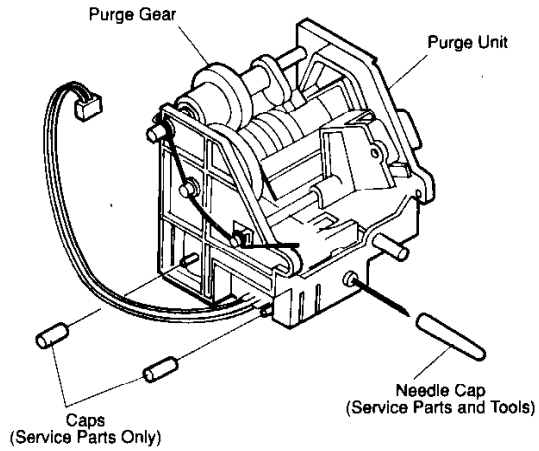
When reassembling the purge unit, move D to mate C with bezel B, then hook the purge unit.

When servicing the purge unit outside the printer, cover the ink needle with its needle cap.

Turning the purge gear may cause ink to flow out from the ink needle.
The ink is a water base ink, but contains an indelible dye, so it cannot be removed from clothing. When servicing the printer, take care not spill ink on the printer, the workbench, your body, or your clothing.

A purge unit for servicing has three protection caps including the needle cap, for transportation. Remove these caps when installing the unit in a printer.





2.2.3 CARRIAGE UNIT

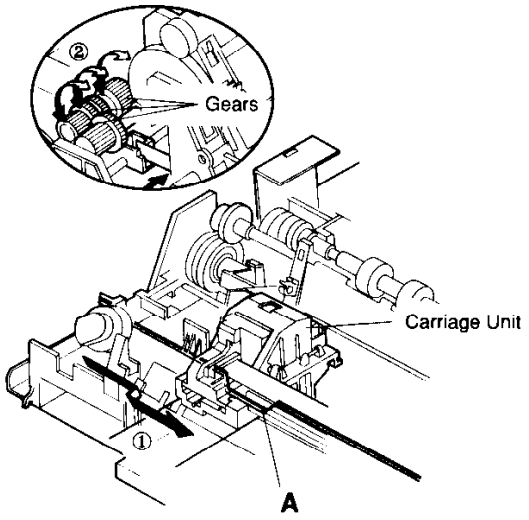
Preparation

Remove the upper case unit.

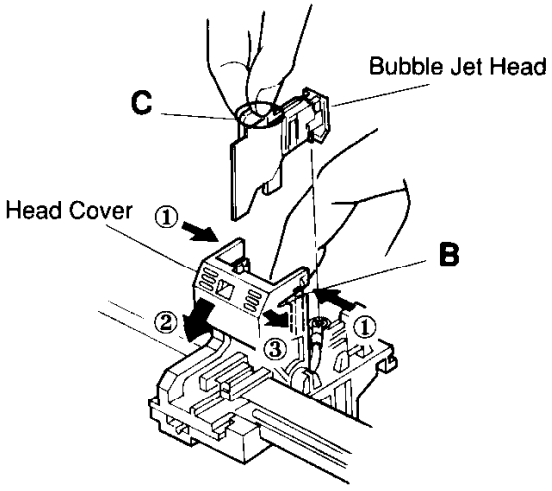
Procedures

1. According the arrow ①, slides the carriage unit to A.

   If the carriage unit does not move, turn the gears in the direction of arrow ② to move it.

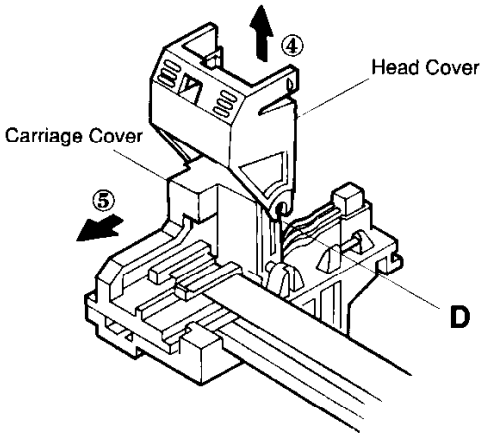


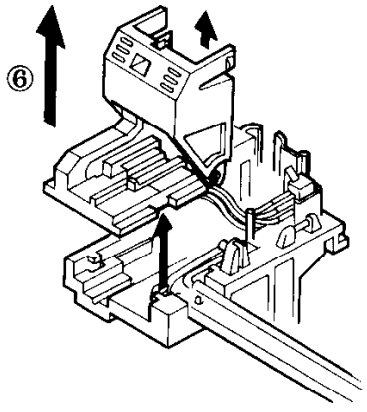
2. Press section B of the head cover in the direction of arrow ①, and open the head cover in the direction of arrow ②.
3. Press section B in the direction of arrow ③, hold C, and remove the bubble jet head.



Hold C only. Holding any other part may damage the bubble jet head.

4. Draw D out of the head cover in the direction of arrow ④.
5. Slide the carriage cover in the direction of arrow ⑤ and remove it in the direction of arrow ⑥.





2.2.4 BUBBLE JET HEAD

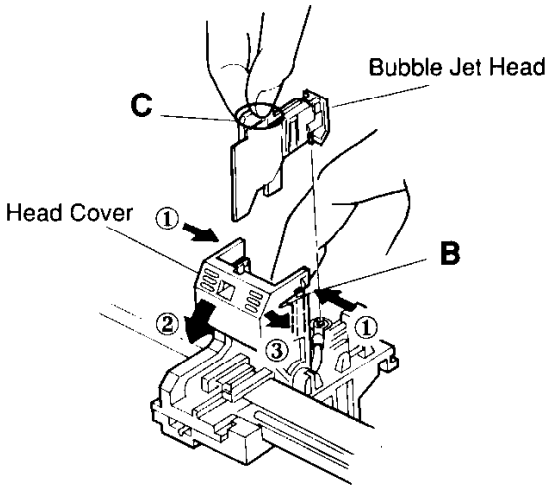
Preparation

Perform steps 1 to 3 of 1.2.3 CARRIAGE UNIT, then remove the bubble jet head.

Procedures

1. Replace the bubble jet head with a new one.

Hold only part C; otherwise the bubble jet head may be damaged.



2. Reassemble the printer in reverse order of disassembly.
3. Set the offline mode, install printing paper, press the *SHIFT* key, hold down the *CLEANING* key, press the *PAPER* and *CARD* keys at the same time, then release the *CLEANING* key to perform reinforced aging.

In reinforced aging, 118 lines (two A4- or letter-size sheets) are printed in black to remove stains from the heaters in the bubble jet head.

When reinforced aging is complete, the beeper sounds and the light on the operator panel flashes.
If an error occurs during reinforced aging, the beeper sounds and the light on the operator panel flashes.
If the beeper sounds and the light flashes, switch the power off, then on again.
If reinforced aging is performed continuously, the service life of the head may be shortened. Reinforced aging should be performed only when required, when the bubble jet head is replaced or when troubleshooting is performed.

3. ADJUSTMENTS

3.1 ADJUSTMENT POINTS

3.1.1 PRINT POSITION ALIGNMENT ADJUSTMENT

This adjustment is made to minimize the shift of vertical lines.
It is required after replacing the logic board, the carriage belt, or the carriage drive motor.

3.1.2 CARRIAGE WIDTH SETTING

The logic board must be set for 136 or 80 characters according to the printer mechanisms.
This is required after replacing the logic board.

3.1.3 PURGE GEAR INSTALLATION

The purge gear and the purge pump gear must be mated.
Remove the cam lock from the purge unit before mating them.

3.1.4. RELEASE LEVER INSTALLATION

The release lever and the gear train around it must be mated when installed.

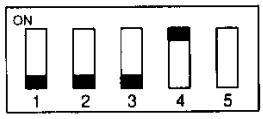
3.1.5 FOLDING FLEXIBLE CABLE

When installing a flexible cable for servicing a printer, fold it as specified.

3.1.1 PRINT POSITION ALIGNMENT ADJUSTMENT

Preparation
Remove upper case, then connect the power cord.

Procedures
1. Place paper.
2. Set DIP switch DSW 3 as shown in the figure on the right.
3. Turn on the printer while holding the *PITCH* key
4. Hold the *PITCH* key down until the *ONLINE* light flashes.
   The printer automatically starts a dot pattern print test.
5. Observing the lines printed from left to right, check the shift of those from right to left.
   Referring to the table below, set DSW 3 while the printer is printing the dot pattern print test to minimize the shift of vertical lines.



DSW 3

Table 4-2

No.	SW3-1	SW3-2	SW3-3	SW3-4	Amount of compensation
1	ON	ON	ON	ON	Large
2	OFF	ON	ON	ON	▲
3	ON	OFF	ON	ON	
4	OFF	OFF	ON	ON	
5	ON	ON	OFF	ON	
6	OFF	ON	OFF	ON	▼
7	ON	OFF	OFF	OFF	Small

No.	SW3-1	SW3-2	SW3-3	SW3-4	Amount of compensation
1	ON	ON	ON	OFF	Small
2	OFF	ON	ON	OFF	▲
3	ON	OFF	ON	OFF	
4	OFF	OFF	ON	OFF	
5	ON	ON	OFF	OFF	
6	OFF	ON	OFF	OFF	
7	ON	OFF	OFF	OFF	▼
8	OFF	OFF	OFF	OFF	Large

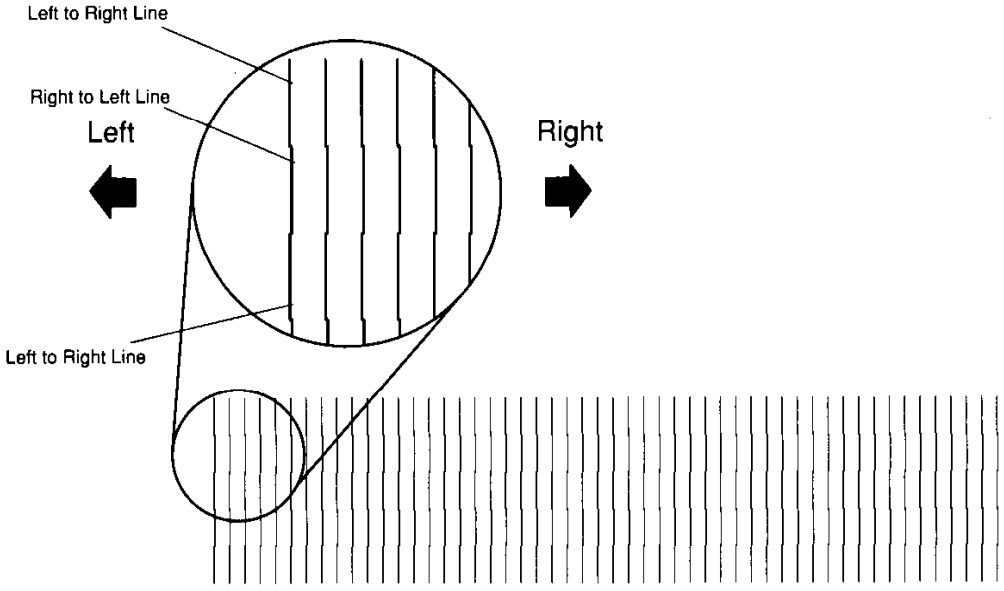


Figure 4-1 Dot Pattern Alignment Adjustment

3.1.2 CARRIAGE WIDTH SETTING

Set the logic board for 136 or 80 characters according to the printer mechanisms.

DSW 3	ON	136 characters
DSW 3	OFF	80 characters

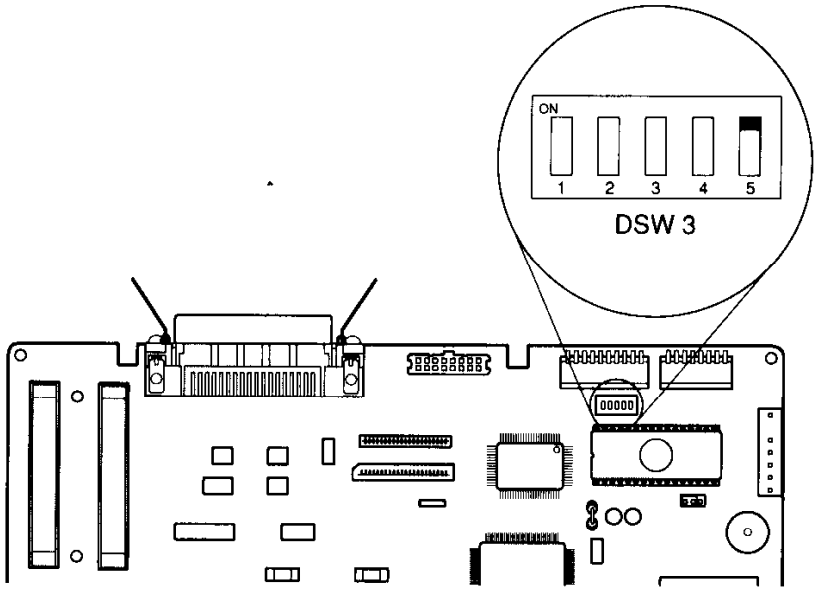


Figure 4-2 Carriage Width Setting

3.1.3 PURGE GEAR INSTALLATION

Procedures

1. Install the purge gear by mating its section A with section B-B' on the purge pump gear.
2. Replace the cam lock while mating them.

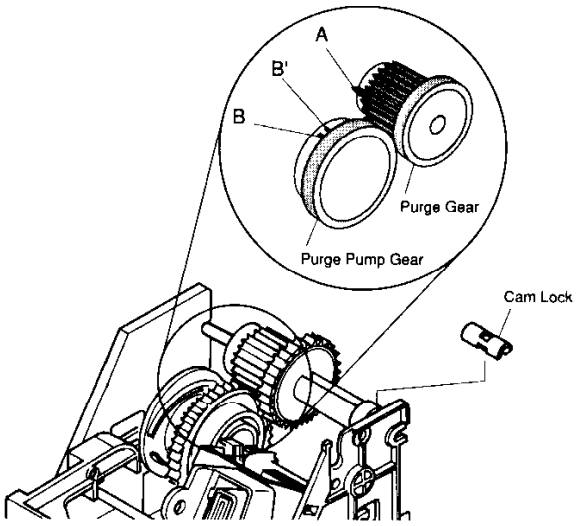
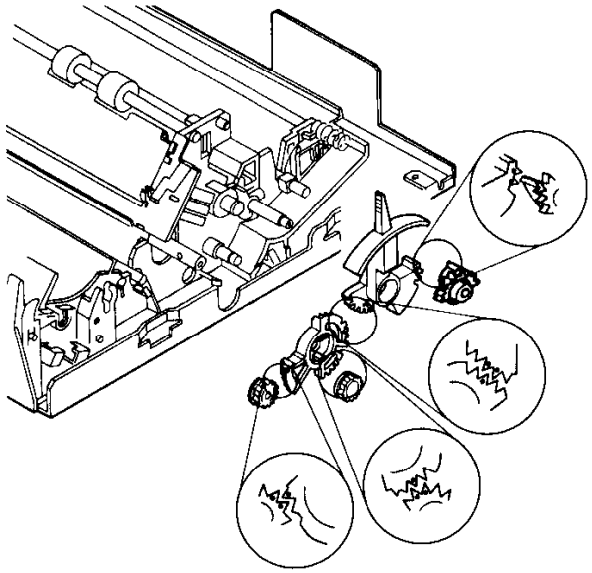


Figure 4-3 Purge Gear Installation

3.1.4 RELEASE LEVER INSTALLATION

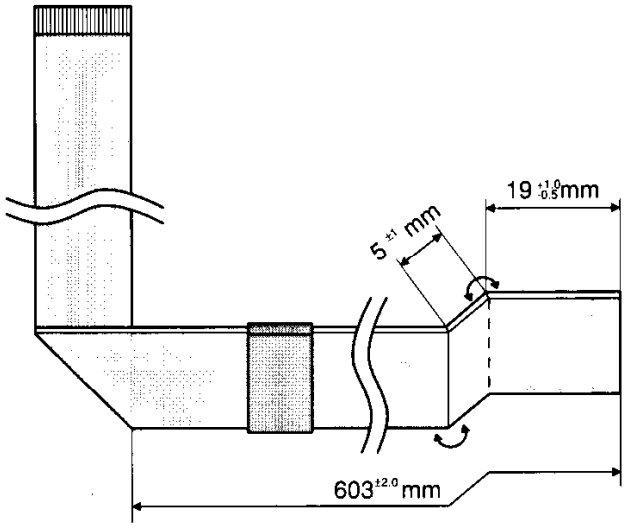
This adjustment is to mate the release lever and the gear train around it.



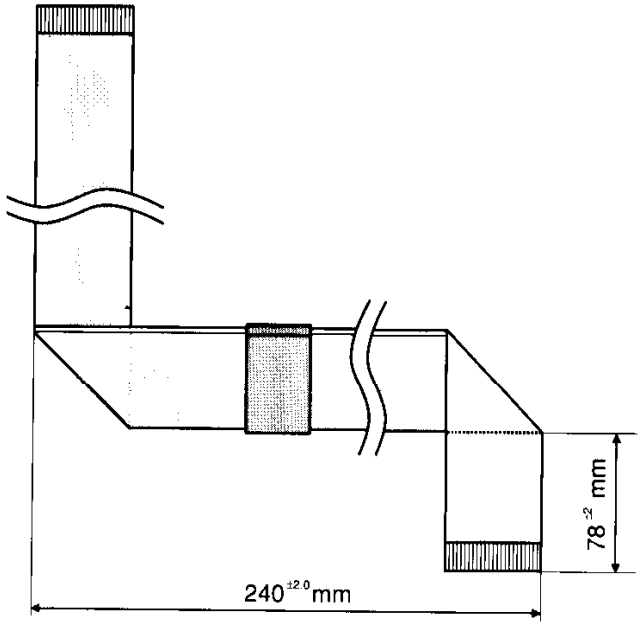
Figuer 4-4 Side Gears Installation

3.1.5 FOLDED FLEXIBLE CABLE

When installing a flexible cable for servicing a printer, it must be folded as specified.



Figuer 4-5 Operator Panel Cable Setting



Figuer 4-6 Carriage Cable Setting

This page intentionally left blank

4. TROUBLESHOOTING

4.1 BEFORE TROUBLESHOOTING

4.1.1 TROUBLESHOOTING OVERVIEW

Troubleshooting consists of error diagnosis, which is required if the cause of an error is unknown, and error analysis, which is performed if the cause of an error is known. If the cause of an error is unknown, perform error diagnosis, and if it is known, perform error analysis.

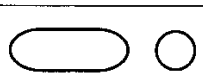
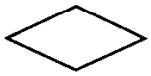
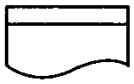
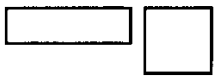
4.1.2 PRECAUTIONS WHEN TROUBLESHOOTING

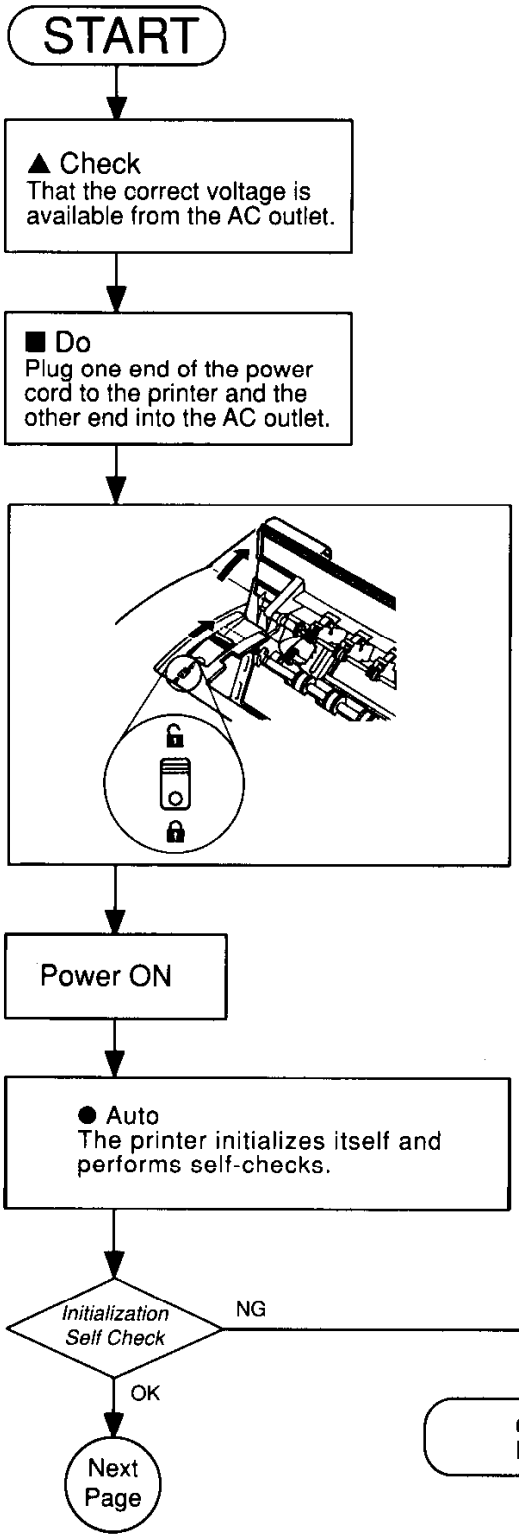
Take the following precautions when troubleshooting, since it involves disassembly and reassembly.

1) Read Part 2, Disassembly and Reassembly, carefully.
2) The plastic components of the printer are secured with hooks and notches rather than screws. Be careful not to bend out of shape or damage a ny of these hooks or notches.
3) The bubble jet head (service part) is supplied without ink. Once filled, the head cannot be stored on its own.
4) The bubble jet head should be replaced only as a last measure. Check other parts first, and, if they are normal, replace the bubble jet head.
5) If the printer is repaired with the power cord connected, be careful you do not get an electric shock from the power supply, and do not short-circuit the PCB.
6) If the ink supply system needs to be repaired, be careful not to stain the printer, work bench, or your clothes.
7) After troubleshooting, make sure that all the connectors have been plugged back in correctly and that all the screws are tight.
8) After troubleshooting, do a print test to make sure the printer works properly.
9) To repack the printer, follow the repacking procedure described in the Installation section.

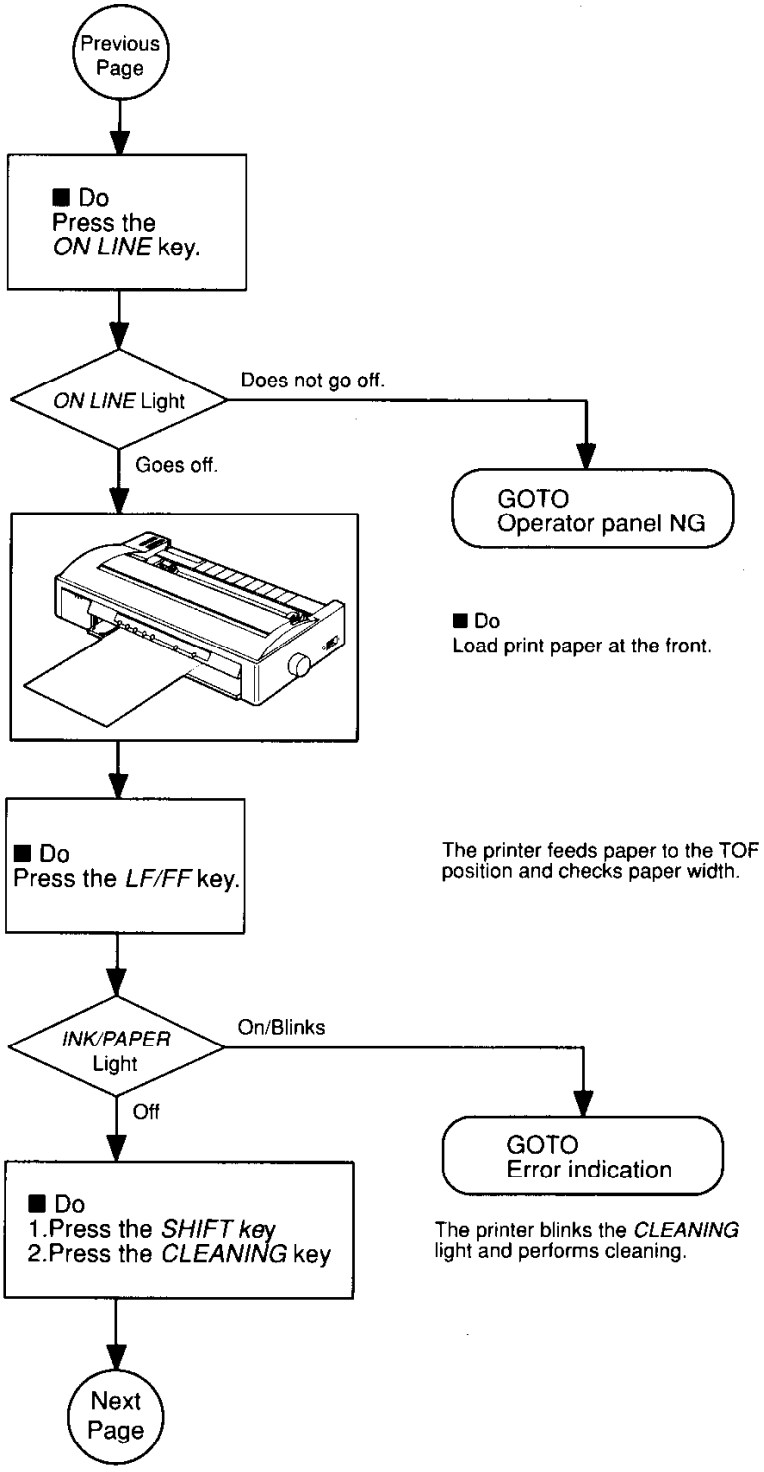
Flowchart symbols

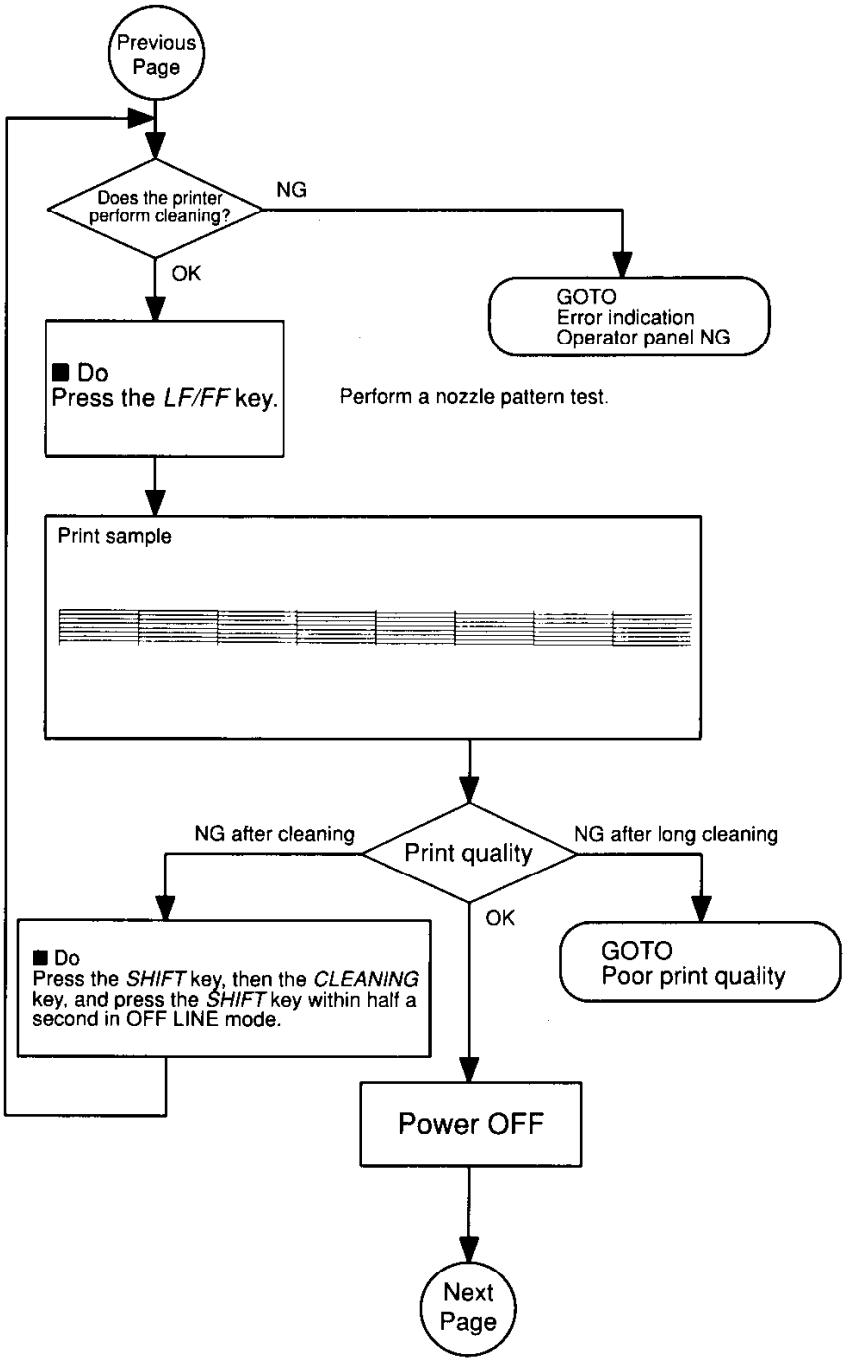
Error diagnosis is given as flowcharts.
The following symbols are used in the flowcharts:

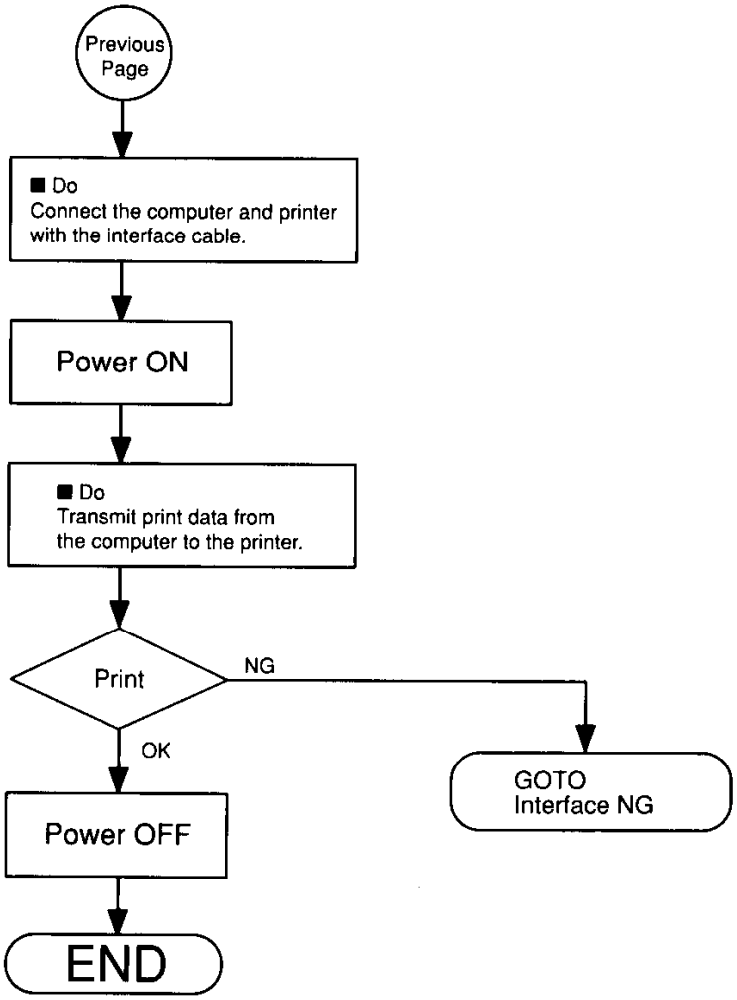
Symbol				
Meaning	Start, end, jump	Decision	Repair/ replacement	Operation



■ Do
Release the carriage lock.


Previous Page
■ Do
Press the
ON LINE key.
ON LINE Light
Does not go off.
Goes off.
GOTO
Operator panel NG
■ Do
Load print paper at the front.
■ Do
Press the LF/FF key.
The printer feeds paper to the TOF position and checks paper width.
INK/PAPER Light
On/Blinks
Off
GOTO
Error indication
■ Do
1.Press the SHIFT key
2.Press the CLEANING key
The printer blinks the CLEANING light and performs cleaning.
Next Page


Previous Page
Does the printer perform cleaning?
NG
OK
GOTO
Error indication
Operator panel NG
■ Do
Press the LF/FF key.
Perform a nozzle pattern test.
Print sample
NG after cleaning
Print quality
NG after long cleaning
OK
■ Do
Press the SHIFT key, then the CLEANING key, and press the SHIFT key within half a second in OFF LINE mode.
GOTO
Poor print quality
Power OFF
Next Page


Previous Page
■ Do
Connect the computer and printer with the interface cable.
Power ON
■ Do
Transmit print data from the computer to the printer.
Print
NG
OK
GOTO Interface NG
Power OFF
END

4.3 ERROR ANALYSIS

4.3.1 CANNOT INITIALIZE 4-21

4.3.2 ERROR INDICATION 4-22

4.3.3 POOR PRINT QUALITY 4-23

4.3.4 PAPER ERROR 4-26

4.3.5 PAPER CANNOT BE LOADED 4-28

4.3.6 PAPER IS LOADED AND EJECTED 4-29

4.3.7 INK ERROR 4-30

4.3.8 INK DOES NOT FLOW 4-32

4.3.9 HP SENSOR NG 4-33

4.3.10 PAPER FEED MOTOR NG 4-34

4.3.11 CARRIAGE DRIVE MOTOR NG 4-35

4.3.12 OPERATOR PANEL NG 4-36

4.3.13 POWER SUPPLY UNIT NG 4-37

4.3.14 INTERFACE NG 4-38

4.3.1 CANNOT INITIALIZE

1. Turn on the printer.

Do all the lights on the operator panel blink once?

Yes **No**

Operator panel NG
GOTO Power supply unit NG

2. Beep sounds once.

Correct?

Yes **No**

Replace the logic board.

3. Check ROM and RAM. If an error is detected, it is indicated by a light and beeper sound.

Correct?

Yes **No**

GOTO Error indication.

4. Check the home position. If an error is detected, it is indicated by a light and beeper sound.

Correct?

Yes **No**

GOTO Error indication.

5. Perform a cleaning operation. If it is not performed, an error is indicated by a light and beeper sound.

Correct?

Yes **No**

GOTO Error indication.

6. Check whether there is an ink cartridge. If not, an error is indicated by a light and beeper sound.

Correct?

Yes **No**

GOTO Error indication.

7. Check ink. If there is no ink, an error is indicated by a light and beeper sound

Correct?

Yes **No**

GOTO Error indication.

8. a. Check whether there is paper at the set position selected by the paper release lever.
   b If there is paper, it is ejected.
   c. If there is no paper, an error is indicated by a light and beep sound.

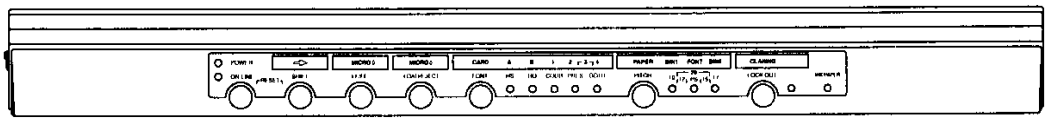
Correct?

Yes **No**

GOTO Error indication.

END

4.3.2 ERROR INDICATION



The following five of the nine lights on the printer indicate printer error conditions with beeper sounds.

Error state	*POWER*	*ON LINE*	*INK/PAPER*	*HS/CARD A*	*HQ/CARD B*	Beeper
Power off	Off	Off	Off	Off	Off	Off
Paper-out/paper jam	On	Off	On	—	—	Three times
No ink/ink cartridge	On	Off	Flashing	—	—	Three times
Home position error	On	Off	Off	Flashing	Flashing	Six times
ROM/RAM error	On	Off	Off	Flashing*	Flashing	Six times
Battery low (RAM CARD)	On	Off	Off	Off	Flashing	Off

* The *COUR*, *PRES*, and *GOTH* lights also flash.

For the functions of the indicators when the printer is working normally, see the User's Manual.

MEASURES WHEN ERRORS ARE INDICATED

Error state	Measure to be taken
Paper-out/paper jam	GOTO Paper error
No ink/ink cartridge	GOTO Ink error
Home position error	GOTO HP sensor NG Paper feed motor NG Carriage drive motor NG
ROM/RAM error	Replace the ROM or logic board.

4.3.3 POOR PRINT QUALITY

1. **Is paper that meets the specifications being used?**

Yes **No**

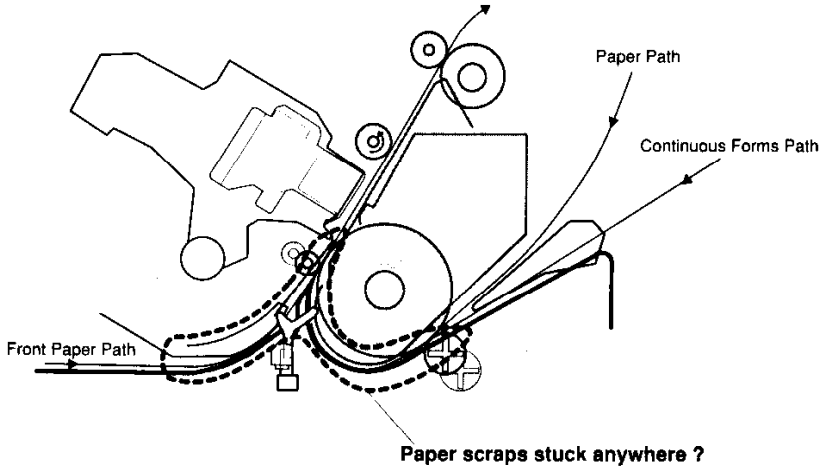
Use paper that meets the specifications.

2. **Does the ink cartridge contain ink? (Shake it lightly.)**

Yes **No**

Replace the ink cartridge.

3. Visually check the platen for paper scraps and ink stains.



Is it clean?

Yes **No**

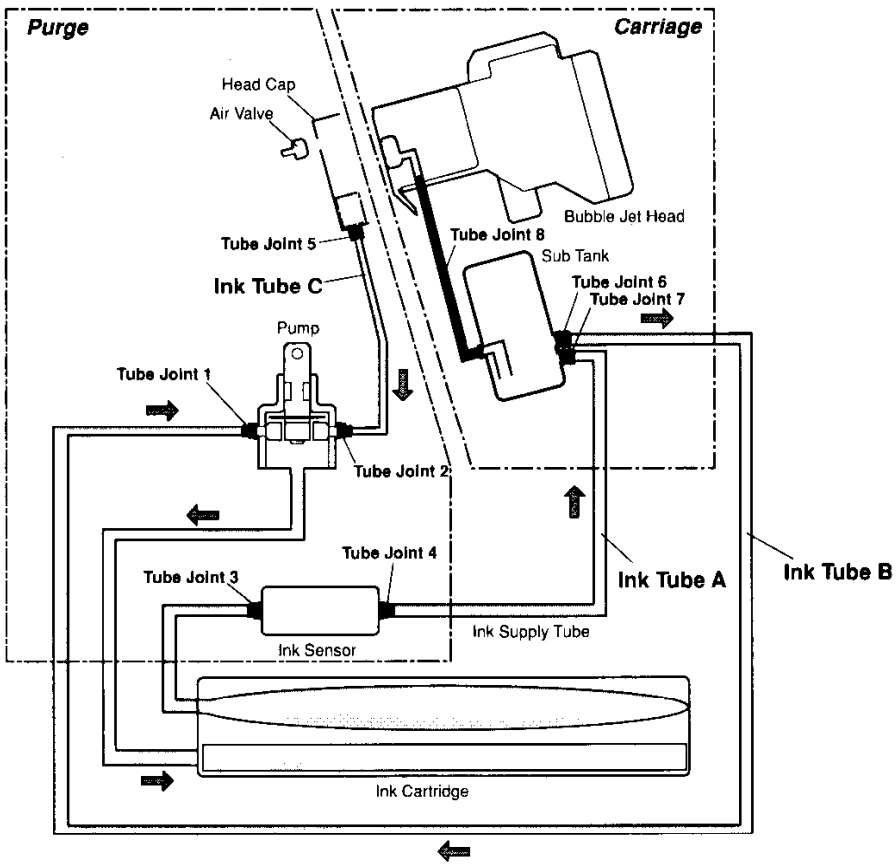
Clean

4. Visually check the spaces at the right and left ends of the carriage.

Are they the same?

Yes **No**

Check the front guide plate and peripheral components. (A hook or notch or a plastic part may be bent, damaged, or not secured properly.)



5. Check that the tube joint (1to 8) does not catch of the ink tubes.

Correct?

Yes **No**

Install the ink tube at the correct position.

6. Check that the ink tubes are not bent.

Correct?

Yes **No**

The carriage unit is defective.

7. Check that the carriage does not catch any of the ink tubes.

Correct?

Yes **No**

Install the ink tube at the correct position.

8. a. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
   b. Ink tubes A and B are always filled with ink.
   c. Ink sometimes flows through ink tube C.

Correct?

Yes **No**

GOTO Ink does not flow

9. a. Perform cleaning operation five times .
   b. Perform a nozzle pattern test and compare the resulting pattern with the sample.

Is the poor print quality?

Yes **No**

END

10. a. Perform a reinforced aging operation.
    b. Turn off the printer and turn on it again.
    c. Perform a cleaning operation.
    d. Perform a nozzle pattern test and compare the resulting pattern with the sample.

Is the poor print quality?

Yes **No**

END

11 Check the flexible cable connection (CNMAIN, J2).

Correct?

Yes **No**

Connect the flexible cable correctly.

12. Check the output or the secondary side of the power supply unit.

Correct?

Yes **No**

The power supply unit is defective.

13. a. Replace the logic board.
    b. Perform a cleaning operation.
    c. Perform a nozzle pattern test and compare the resulting pattern with the sample.

Is the poor print quality?

Yes **No**

END

14. a. Install the logic board in its original position.
    b. Replace the carriage board.
    c. Perform a cleaning operation.
    d. Perform a nozzle pattern test and compare the resulting pattern with the sample.

Is the poor print quality?

Yes **No**

END

15. a. Install the logic board in its original position.
    b. Perform a reinforced aging operation.
    c. Perform a nozzle pattern test and compare the resulting pattern with the sample.

Is the poor print quality?

Yes **No**

END

16. The bubble jet head is defective.

Print sample

4.3.4 PAPER ERROR

1. **Is paper that meets the specifications being used?**

Yes **No**

Use paper that meets the specifications.

2. a. Insert the print paper.
   b. Press the *LF/FF* key

Is the paper loaded into the printer?

Yes **No**

GOTO Print paper cannot be loaded.
GOTO Print paper is loaded and ejected.

3. Visually check whether the paper is loaded to the TOF position.

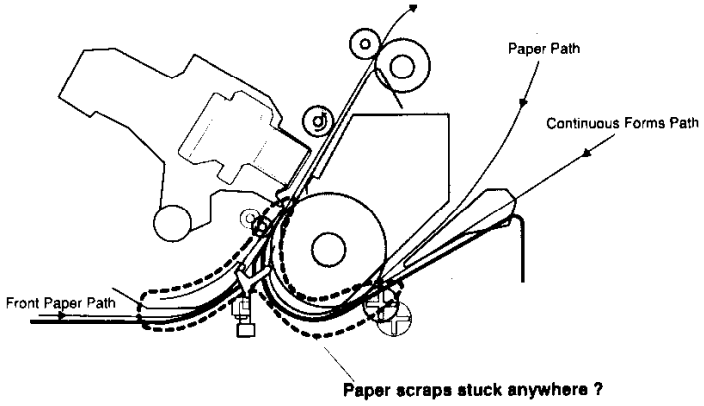
Is the paper loaded to the TOF position?

Yes **No**

4. Check for paper jam.

Correct?

Yes **No**



Remove paper scraps.

Check the paper passes through.

5. a. Press the *LF/FF* key and eject the paper.
   b. Load the paper again.

Paper error ?

Yes **No**

END

6. a. Turn off the Printer.
   b. Check whether the paper width sensor is connected correctly.

Correct?

Yes **No**

Connect the paper width sensor correctly.

7. a. Turn on the printer.
   b. Load the paper.
   c. Move the carriage over and beyond the paper manually, and check the paper width sensor output at connector J2.

+	-	Normal
J2		
1	3	(Over the paper) (Beyond the paper)

Correct?

Yes **No**

Replace the paper width sensor.

Replace the logic board.

4.3.5 PAPER CANNOT BE LOADED

1. **Is cut sheets selected?**

Yes **No**

Select cut sheets with the paper release lever.

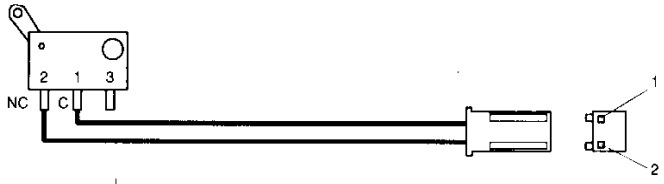
2.a. Switch the printer power off.
b. Check whether the paper release sensor connector (J13) is connected correctly.

Is it connected correctly?

Yes **No**

Connect the paper release sensor correctly.

3. Check the paper release sensor.



+	-	**Normal**
Paper release sensor		
1	2	∞ Ω(ON) 0 Ω (OFF)

Correct?

Yes **No**

The paper select sensor is defective.

4. Check the Operator panel. (See Operator panel NG.)

Correct?

Yes **No**

The Operator panel is defective.

5. Replace the logic board.

4.3.6 PAPER IS LOADED AND EJECTED

1. Check whether the EOF sensor connector (J3) is connected correctly.

Is it connected correctly?

Yes **No**

Connect the connector correctly.

2.a. Switch the printer power on.
b. Load the print paper.
c. Check the EOF sensor output at connector J3 when the paper is loaded and when it is ejected.

+	-	Normal
J3		
1	3	High level (There is paper) low level (There is no paper)

Correct?

Yes **No**

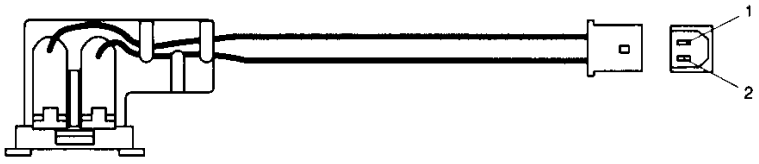
The EOF sensor is defective.

3. Replace the logic board.

4.3.7 INK ERROR

1.a. Remove the ink cartridge.
b. Shake the cartridge lightly.
Does the cartridge contain ink?
Yes **No**
| |
| The cartridge is defective.
|
2. Remount the cartridge.
Ink error?
Yes **No**
| |
| END
|
3.a. Turn off the Printer.
b. Check whether the ink sensor connector (J4) and electrode unit (cartridge sensor connector) (J12) are connected correctly.

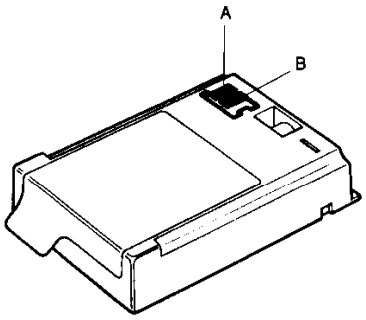
Are they connected correctly?
Yes **No**
| |
| Connect them correctly.
|
4. Check the electrode unit (cartridge sensor).
Correct?



Yes **No**
| |
| Replace the electrode unit (cartridge sensor).
| |
| 5. Turn on the Printer.
| **Ink error?**
| **Yes** **No**
| | |
| | END
| |
| Replace the ink cartridge.
| **Ink error?**
| **Yes** **No**
| | |
| | END
| |
| The logic board is defective.
|

6 Make the resistance check the ink cartridge.

+	-	Normal
Ink cartridge		
A	B	20KΩ



Correct?

Yes **No**

The ink cartridge are defective.

7.a. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
b. Ink tubes A and B are always filled with ink.
c. Ink sometimes flows through ink tube C.

Does the ink flow correctly?

Yes **No**

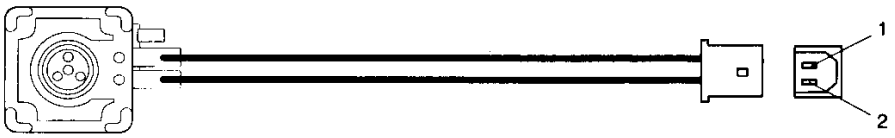
GOTO Ink does not flow

8. **Ink error?**

Yes **No**

END

9.a. Turn off the Printer.
b. Unplug J4 (Ink sensor connector) from Logic board.
c. Make the resistance check the J4 (Ink sensor connector).



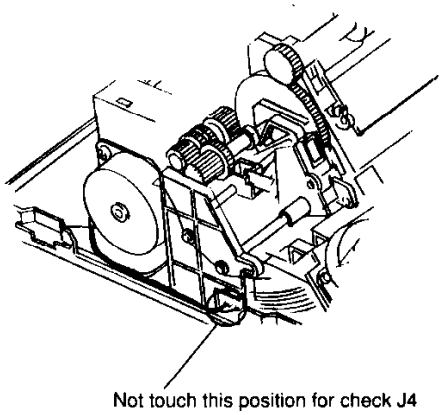
+	-	Normal
J4		
1	2	continuity

Correct?

Yes **No**

The ink sensors are defective.

10. The logic board is defective.



4.3.8 INK DOES NOT FLOW

1.a. Remove and reinstall the bubble jet head.
b. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
c. Ink tubes A and B are always filled with ink.
d. Ink sometimes flows through ink tube C.

Ink does not flow?

Yes **No**

END

2.a. Perform a reinforced aging operation.
b. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
c. Ink tubes A and B are always filled with ink.
d. Ink sometimes flows through ink tube C.

Ink does not flow?

Yes **No**

END

3.a. Replace the purge unit.
b. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
c. Ink tubes A and B are always filled with ink.
d. Ink sometimes flows through ink tube C.

Ink does not flow?

Yes **No**

END

4.a. Replace the carriage unit.
b. Perform extended cleaning three times, paying attention to ink tubes A, B, and C.
c. Ink tubes A and B are always filled with ink.
d. Ink sometimes flows through ink tube C.

Ink does not flow?

Yes **No**

END

5. The bubble jet head is defective.

4.3.9 HP SENSOR NG

1. Check whether the HP sensor and carriage board connectors (CNHP, HP sensor) are connected correctly.

Are they connected correctly?

Yes — **No**

No: Connect the connectors correctly.

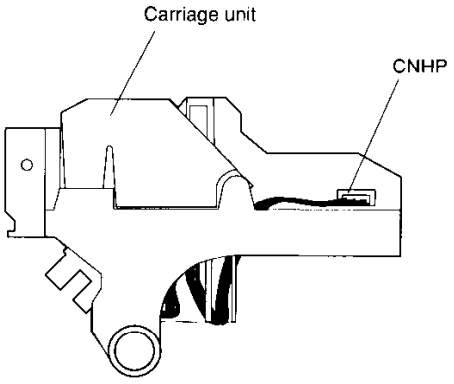
2. Check whether the carriage board and logic board connectors (CNMAIN, J2) are connected correctly.

Are they connected correctly?

Yes — **No**

No: Connect the connectors correctly.

3. a. Turn on the Printer.
   b. Move the carriage manually to the home position and to another position, and check the HP sensor output at connector CNHP.



+	-	Normal
J2		
1	3	+3.8 V (at the home position) 0 V (not at the home position)

Correct?

Yes — **No**

No: The HP sensor is defective.

Yes: 4.END

4.3.10 PAPER FEED MOTOR NG

1. a. Turn off the Printer.
   b. Check whether the gear can be turned manually.

Correct?

Yes **No**

The gear is defective or is installed incorrectly.

2. Rotate the knob once or twice manually.

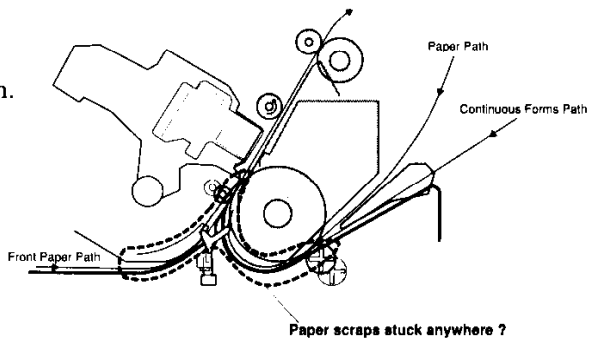
Does the knob rotate?

Yes **No**

3. Check for paper jam.

Correct?

Yes **No**



Remove paper scraps.

Check the paper passes through.

4. Check whether the paper feed motor connector (J5) is connected correctly.

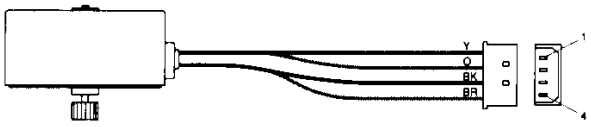
Is it connected correctly?

Yes **No**

Connect the connector correctly.

5. Check the paper feed motor.

+	-	Normal
J5		
1	2	10 Ω
3	4	10 Ω



Correct?

Yes **No**

The paper feed motor is defective.

6. The logic board is defective.

4.3.12 OPERATOR PANEL NG

1.a. Turn off the Printer.

b. Check whether the control panel connectors are plugged in correctly.

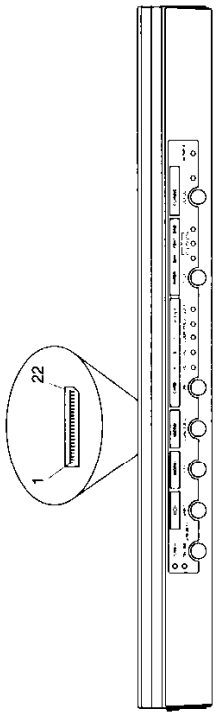
Are they plugged in correctly?

Yes — **No**

Plug them in correctly.

2. Check the Operator panel.

+	-	Normal
Operator panel		
21	22	∞ Ω
20	4	0 Ω
19		
18		
17		
16		
15		
2	1	On
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		



Correct?

Yes — **No**

The Operator panel is defective.

END

4.3.13 POWER SUPPLY UNIT NG

1.a. Turn off the Printer.
b. Remove the fuse.
c. Check the fuse.

+	-	Normal
Fuse		
A	B	0 Ω

Is the fuse correct?

Yes | **No**

No: The fuse is defective.

2.a. Connect the power cord to an AC outlet and to the printer.
b. Switch the printer power on.
c. Check the output connector (J1) on the secondary side.

+	-	Normal
J1		
1	2	+5 Vdc
3	4	+28 Vdc±2 Vdc
5	6	+28 Vdc±0.2 Vdc

Correct?

Yes | **No**

No: The power supply unit is defective.

3.END

4.3.14 INTERFACE NG

1. **Does the printer print?**

Yes

4.a. Turn off the Printer.
b. Connect the interface cable to the printer and computer.
c. Hold down the *PITCH* key and Turn on the Printer; select the HEX dump test mode.
d. Print and compare the transmitted data with the output result.

Correct?

Yes

5.END

No

2.a. Turn off the Printer.
b. Check whether the parallel interface has been selected. (SW1-3 ON)

Yes

3. The logic board is defective.

No

Select the parallel interface.

No

The logic board is defective.

5. WIRING DIAGRAM

5.1 WIRING DIAGRAM

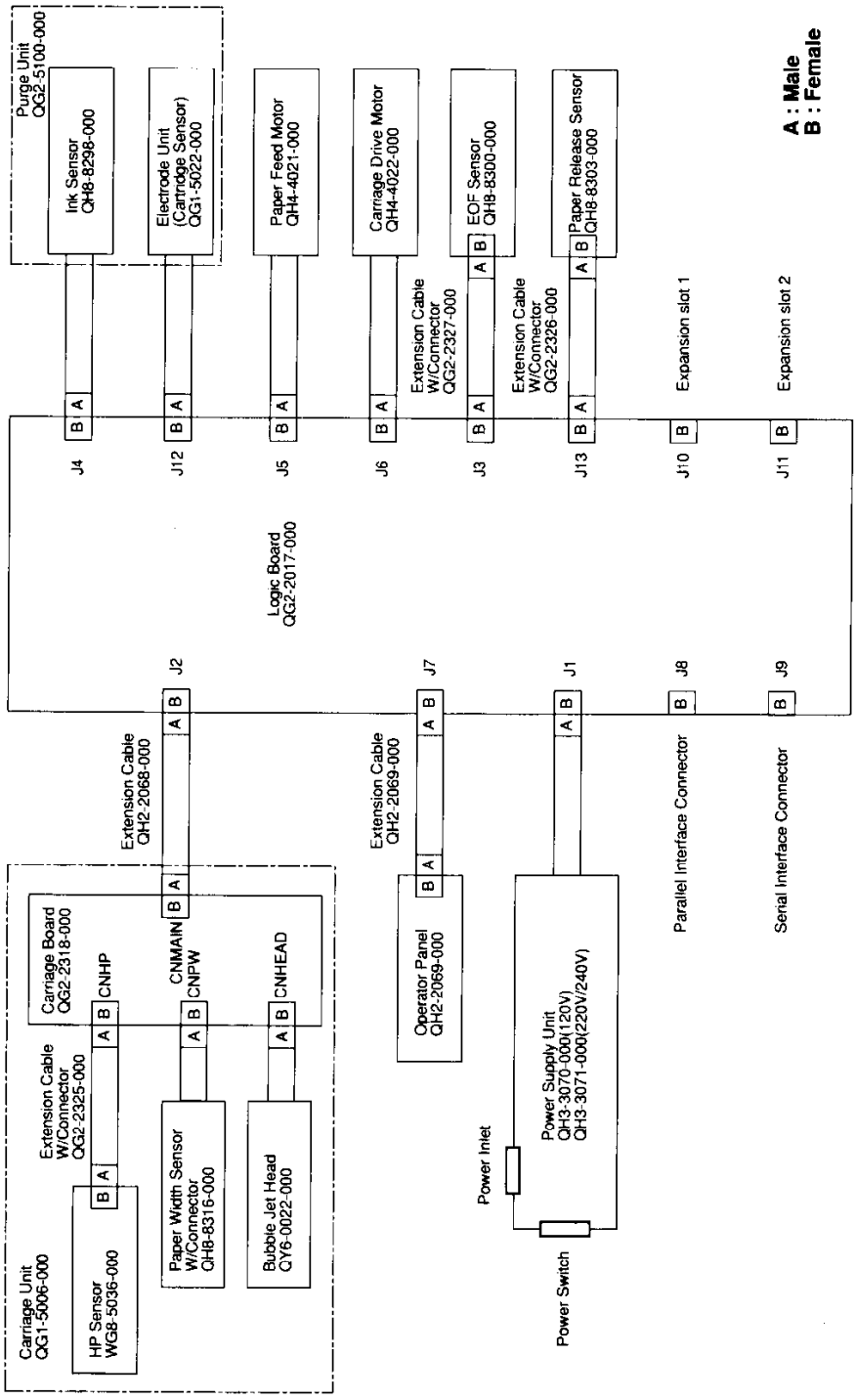


Figure 4-7 Wiring Diagram

5.2. LOCATION AND SIGNAL ASSIGNMENT

5.2.1 CONNECTOR LOCATION AND ASSIGNMENT

A) LOGIC BOARD

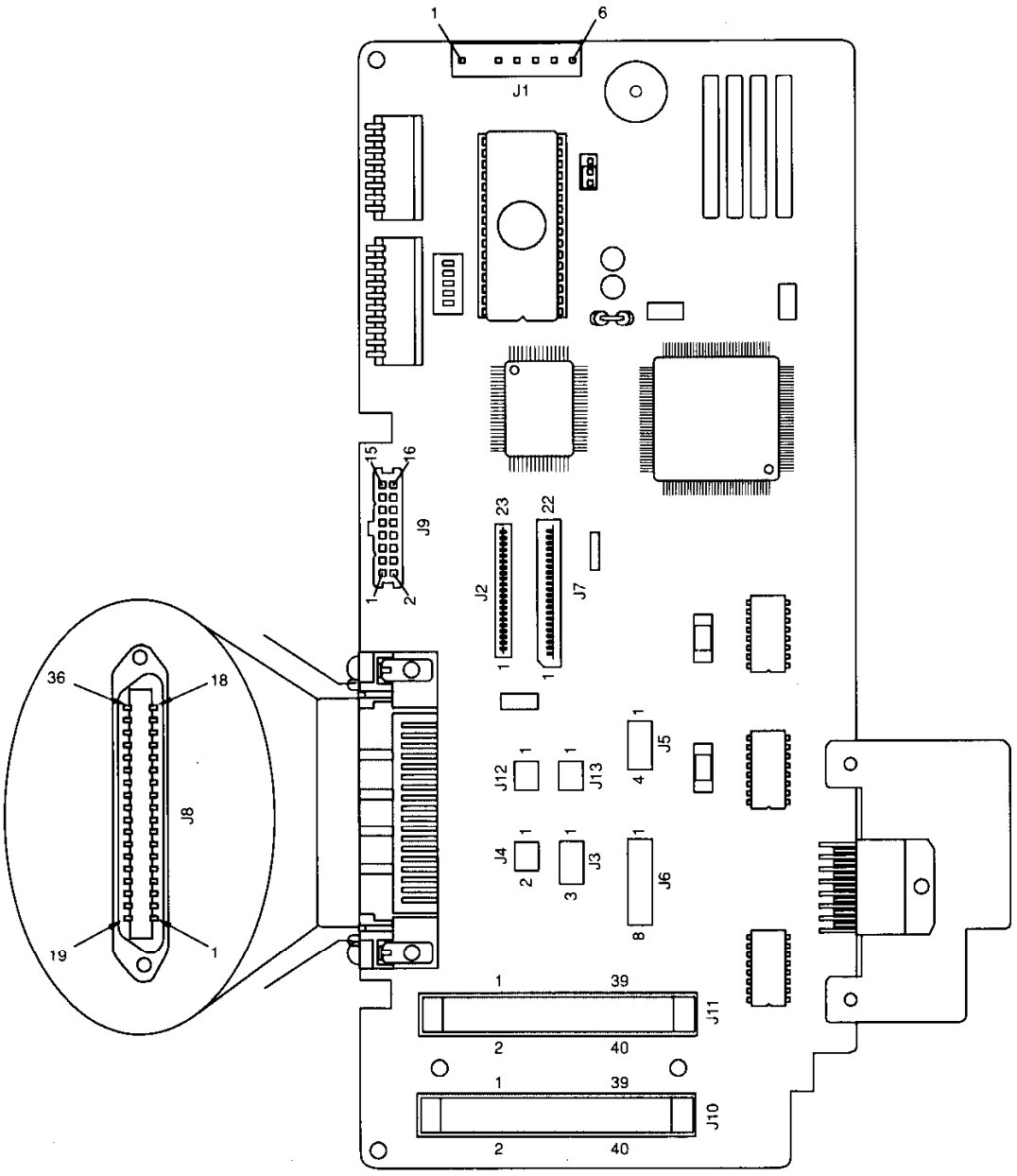


Figure 4-8 Logic Board

Table 4-3 Logic board connector assignment

J1 (DC Power inlet connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	IN	VCC	+5 VDC
2	GND	---	GROUND	
3	VM	IN	VM	+28 V±2 VDC
4	GND	---	GROUND	
5	VOP	IN	VOP	+28 V±0.2 VDC
6	GND	---	GROUND	

J2 (Logic board to carriage board connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	OUT	VCC	+5 VDC
2	GND	---	GROUND	
3	CLKI	OUT	DATA TRANSFER CLOCK	
4	GND	---	GROUND	
5	BEI3	OUT	HEAT PULSE 3	
6	-LATI	OUT	DATA LATCH PULSE	
7	BEI1	OUT	HEAT PULSE 1	
8	BEI2	OUT	HEAT PULSE 2	
9	RESI	OUT	RESET PULSE	
10	BEI0	OUT	HEAT PULSE 0	
11	HP	IN	HOME POSITION SENSE	
12	SI	OUT	DATA INPUT SIGNAL	
13	VOP	OUT	VOP	+28 V±0.2 VDC
14	VOP	OUT	VOP	+28 V±0.2 VDC
15	TH2	IN	THERMISTOR 2	
16	VOP	OUT	VOP	+28 V±0.2 VDC
17	GND	---	GROUND	
18	PWIDTH	IN	PAPER WIDTH SENSE	
19	GND	---	GROUND	
20	HRANK	IN	HEAD HEAT RANK SENSE	
21	GND	---	GROUND	
22	TH1	IN	THERMISTOR 1	
23	GND	---	GROUND	

J3 (EOF sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	PE	IN	END OF FORM SENSE	
2	VCC	OUT	VCC	+5 VDC
3	GND	---	GROUND	

J4 (Ink sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	INK	IN	INK OUT SENSE	HIGH/LOW(SENSE)
2	-IEN	OUT	INK SENSE ENABLE	

Table 4-3 Logic board connector assignment

J5 (Paper feed motor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	A	OUT	P.F.MOTOR PHASE A	
2	-A	OUT	P.F.MOTOR PHASE -A	
3	B	OUT	P.F.MOTOR PHASE B	
4	-B	OUT	P.F.MOTOR PHASE -B	

J6 (Carriage drive motor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	A-A	OUT	C.D. MOTOR PHASE A	
2	AA	OUT	C.D. MOTOR PHASE -A	
3	B-B	OUT	C.D. MOTOR PHASE B	
4	BB	OUT	C.D. MOTOR PHASE -B	
5	P A IN	IN	PHASE A INPUT	
6	P B IN	IN	PHASE B INPUT	
7	VCC	OUT	VCC	+5 VDC
8	GND	---	GROUND	

J7 (Operator panel connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	OUT	VCC	+5VDC
2	-LLO	OUT	LOCK OUT LED ENABLE	HIGH/LOW(ENABLE)
3	-L10	OUT	10 LED ENABLE	HIGH/LOW(ENABLE)
4	-LPS	OUT	PS LED ENABLE	HIGH/LOW(ENABLE)
5	-L17	OUT	17 LED ENABLE	HIGH/LOW(ENABLE)
6	-LSHIFT	OUT	SHIFT LED ENABLE	HIGH/LOW(ENABLE)
7	-LIN/PA	OUT	INK/PAPER LED ENABLE	HIGH/LOW(ENABLE)
8	-LHS	OUT	HS LED ENABLE	HIGH/LOW(ENABLE)
9	-LHQ	OUT	HQ LED ENABLE	HIGH/LOW(ENABLE)
10	-LCOUR	OUT	COUR LED ENABLE	HIGH/LOW(ENABLE)
11	-LPRES	OUT	PRES LED ENABLE	HIGH/LOW(ENABLE)
12	-LGOTH	OUT	GOTH LED ENABLE	HIGH/LOW(ENABLE)
13	-LONLINE	OUT	ON LINE LED ENABLE	HIGH/LOW(ENABLE)
14	-LPOWER	OUT	POWER LED ENABLE	HIGH/LOW(ENABLE)
15	KSHIFT	IN	SHIFT KEY	HIGH/LOW(KEY IN)
16	KPITCH	IN	PITCH KEY	HIGH/LOW(KEY IN)
17	KLO	IN	LOCK OUT KEY	HIGH/LOW(KEY IN)
18	KFONT	IN	FONT KEY	HIGH/LOW(KEY IN)
19	KLO/EJ	IN	LOAD/EJECT KEY	HIGH/LOW(KEY IN)
20	KLF/FF	IN	LF/FF KEY	HIGH/LOW(KEY IN)
21	KONLINE	IN	ON LINE KEY	HIGH/LOW(KEY IN)
22	GND	---	GROUND	

J8 (Parallel Interface connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	-STB	IN	STROBE	HIGH/LOW(ENABLE)
2	D0	IN	INPUT DATA D0	HIGH(ENABLE)/LOW
3	D1	IN	INPUT DATA D1	HIGH(ENABLE)/LOW
4	D2	IN	INPUT DATA D2	HIGH(ENABLE)/LOW
5	D3	IN	INPUT DATA D3	HIGH(ENABLE)/LOW
6	D4	IN	INPUT DATA D4	HIGH(ENABLE)/LOW

Table 4-3 Logic board connector assignment

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
17	D5	IN	INPUT DATA D5	HIGH(ENABLE)/LOW
8	D6	IN	INPUT DATA D6	HIGH(ENABLE)/LOW
9	D7	IN	INPUT DATA D7	HIGH(ENABLE)/LOW
10	-ACK	OUT	ACKNLG	HIGH/LOW(ENABLE)
11	BUSY	OUT	BUSY	HIGH(ENABLE)/LOW
12	PE	OUT	PAPER EMPTY	HIGH(ENABLE)/LOW
13	SLCT	OUT	SELECT	HIGH(ENABLE)/LOW
14	-AUFEXT	---	AUTO FEED XT	HIGH/LOW(ENABLE)
15	N.C	---	NOT CONNECT	
16	GND	---	GROUND	
17	N.C	---	NOT CONNECT	
18	N.C	---	NOT CONNECT	
19	GND	---	GROUND	
20	GND	---	GROUND	
21	GND	---	GROUND	
22	GND	---	GROUND	
23	GND	---	GROUND	
24	GND	---	GROUND	
25	GND	---	GROUND	
26	GND	---	GROUND	
27	GND	---	GROUND	
28	GND	---	GROUND	
29	GND	---	GROUND	
30	GND	---	GROUND	
31	-INIT	IN	INIT	HIGH/LOW(ENABLE)
32	-ERROR	OUT	ERROR	HIGH/LOW(ENABLE)
33	GND	---	GROUND	
34	N.C	---	NOT CONNECT	
35	VCC	---	VCC	+5 VDC
36	-SLCT IN	IN	SELECT-IN	HIGH/LOW(ENABLE)

J9 (Serial interface connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	GND	---	GROUND	
2	GND	---	GROUND	
3	VCC	OUT	VCC	+5 VDC
4	DSWIN5	IN	DIP SW IN 5	
5	DSWIN4	IN	DIP SW IN 4	
6	DSWIN3	IN	DIP SW IN 3	
7	DSWIN2	IN	DIP SW IN 2	
8	DSWIN1	IN	DIP SW IN 1	
9	DSWIN0	IN	DIP SW IN 0	
10	DSWOUT3	OUT	DIP SW OUT 3	
11	DSWOUT2	OUT	DIP SW OUT 2	
12	DSR	IN	DATA SET READY	
13	CTS	IN	CLEAR TO SEND	
14	RTS	OUT	REQUEST TO SEND	
15	RXD	IN	RECEIVE DATA	
16	TXD	OUT	TRANSMIT DATA	

Table 4-3 Logic board connector assignment

J10 (Expansion slot 1)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	FG	---	FRAME GROUND	
2	GND	---	GROUND	
3	VCC	OUT	VCC	+5 VDC
4	BCHECK	IN	BATTERY CHECK	HIGH/LOW(EMPTY)
5	A0	OUT	ADDRESS BUS A0	
6	A1	OUT	ADDRESS BUS A1	
7	A2	OUT	ADDRESS BUS A2	
8	A3	OUT	ADDRESS BUS A3	
9	A4	OUT	ADDRESS BUS A4	
10	A5	OUT	ADDRESS BUS A5	
11	A6	OUT	ADDRESS BUS A6	
12	A7	OUT	ADDRESS BUS A7	
13	A8	OUT	ADDRESS BUS A8	
14	A9	OUT	ADDRESS BUS A9	
15	A10	OUT	ADDRESS BUS A10	
16	A11	OUT	ADDRESS BUS A11	
17	A12	OUT	ADDRESS BUS A12	
18	A13	OUT	ADDRESS BUS A13	
19	A14	OUT	ADDRESS BUS A14	
20	A15	OUT	ADDRESS BUS A15	
21	D0(A16)	IN/OUT	DATA BUS D0/ADDRESS BUS A16	
22	D1(A17)	IN/OUT	DATA BUS D1/ADDRESS BUS A17	
23	D2(A18)	IN/OUT	DATA BUS D2/ADDRESS BUS A18	
24	D3(A19)	IN/OUT	DATA BUS D3/ADDRESS BUS A19	
25	D4(A20)	IN/OUT	DATA BUS D4/ADDRESS BUS A20	
26	D5(A21)	IN/OUT	DATA BUS D5/ADDRESS BUS A21	
27	D6(A22)	IN/OUT	DATA BUS D6/ADDRESS BUS A22	
28	D7(A23)	IN/OUT	DATA BUS D7/ADDRESS BUS A23	
29	ALE	OUT	ADDRESS LATCH ENABLE	HIGH(ENABLE)/LOW
30	R/-W	IN/OUT	DATA READ/WRITE	HIGH(READ)/LOW(WRITE)
31	E	OUT	ENABLE	
32	-SROT1	OUT	SELECT SLOT 1	HIGH/LOW(ENABLE)
33	-CL	OUT	RESET	HIGH/LOW(ENABLE)
34	OCRE	---	MEMORY CARD CONTROL SIGNAL	HIGH(ENABLE)/LOW
35	CRE	---	MEMORY CARD CONTROL SIGNAL	HIGH(ENABLE)/LOW
36	IROM	---	NOT USED	
37	MC1	IN	MEMORY CARD INSTALL CHECK 1	HIGH/LOW(INSTALL)
38	VCC	OUT	VCC	+5 VDC
39	GND	---	GROUND	
40	FG	---	FRAME GROUND	

J11 (Expansion slot 2)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	FG	---	FRAME GROUND	
2	GND	---	GROUND	
3	VCC	OUT	VCC	+5 VDC
4	BCHECK	IN	BATTERY CHECK	HIGH/LOW(EMPTY)
5	A0	OUT	ADDRESS BUS A0	
6	A1	OUT	ADDRESS BUS A1	

Table 4-3 Logic board connector assignment

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
7	A2	OUT	ADDRESS BUS A2	
8	A3	OUT	ADDRESS BUS A3	
9	A4	OUT	ADDRESS BUS A4	
10	A5	OUT	ADDRESS BUS A5	
11	A6	OUT	ADDRESS BUS A6	
12	A7	OUT	ADDRESS BUS A7	
13	A8	OUT	ADDRESS BUS A8	
14	A9	OUT	ADDRESS BUS A9	
15	A10	OUT	ADDRESS BUS A10	
16	A11	OUT	ADDRESS BUS A11	
17	A12	OUT	ADDRESS BUS A12	
18	A13	OUT	ADDRESS BUS A13	
19	A14	OUT	ADDRESS BUS A14	
20	A15	OUT	ADDRESS BUS A15	
21	D0(A16)	IN/OUT	DATA BUS D0/ADDRESS BUS A16	
22	D1(A17)	IN/OUT	DATA BUS D1/ADDRESS BUS A17	
23	D2(A18)	IN/OUT	DATA BUS D2/ADDRESS BUS A18	
24	D3(A19)	IN/OUT	DATA BUS D3/ADDRESS BUS A19	
25	D4(A20)	IN/OUT	DATA BUS D4/ADDRESS BUS A20	
26	D5(A21)	IN/OUT	DATA BUS D5/ADDRESS BUS A21	
27	D6(A22)	IN/OUT	DATA BUS D6/ADDRESS BUS A22	
28	D7(A23)	IN/OUT	DATA BUS D7/ADDRESS BUS A23	
29	ALE	OUT	ADDRESS LATCH ENABLE	HIGH(ENABLE)/LOW
30	R/-W	IN/OUT	DATA READ/WRITE	HIGH(READ)/LOW(WRITE)
31	E	OUT	ENABLE	
32	-SLOT2	OUT	SELECT SLOT 2	HIGH/LOW(ENABLE)
33	-CL	OUT	RESET	HIGH/LOW(ENABLE)
34	OCRE	---	MEMORY CARD CONTROL SIGNAL	
35	CRE	---	MEMORY CARD CONTROL SIGNAL	
36	IROM	---	NOT USED	
37	MC2	IN	MEMORY CARD INSTALL CHECK 2	HIGH/LOW(INSTALL)
38	VCC	OUT	VCC	+5 VDC
39	GND	---	GROUND	
40	FG	---	FRAME GROUND	

J12 (Electrode unit connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	IDS	IN	INKCARTRIDGE OUT SENSE	SENSE(0.38 V TO 1.58 V)
2	GND	---	GROUND	

J13 (Paper release sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	RRS	IN	RELEASE POSITION SENSE	HIGH(RELEASE)/LOW
2	GND	---	GROUND	

B) CARRIAGE BOARD

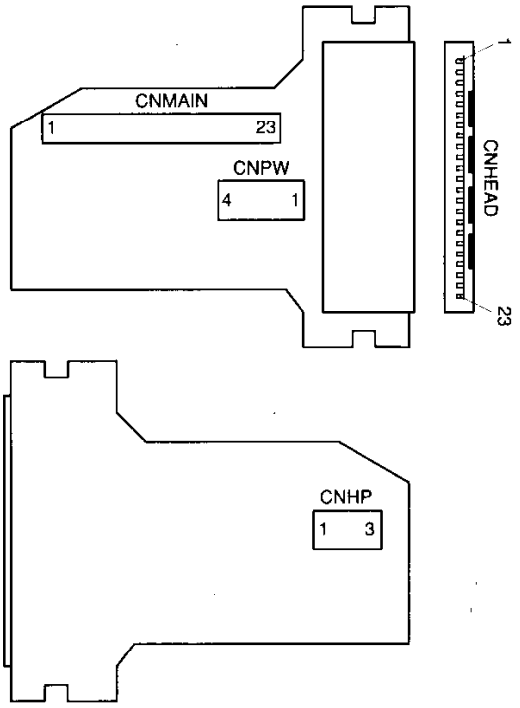


Figure 4-9 Carriage Board

Table 4-4 Carriage board connector assignment

CNMAIN (Carriage board to logic board connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	IN	VCC	+5 VDC
2	GND	---	GROUND	
3	CLKI	IN	DATA TRANSFER CLOCK	
4	GND	---	GROUND	
5	BEI3	IN	HEAT PULSE 3	
6	-LATI	IN	DATA LATCH PULSE	
7	BEI1	IN	HEAT PULSE 1	
8	BEI2	IN	HEAT PULSE 2	
9	RESI	IN	RESET PULSE	
10	BEI0	IN	HEAT PULSE 0	
11	HP	OUT	HOME POSITION SENSE	
12	SI	IN	DATA INPUT SIGNAL	
13	VOP	IN	VOP	+28 V±0.2 VDC
14	VOP	IN	VOP	+28 V±0.2 VDC
15	TH2	OUT	THERMISTOR 2	
16	VOP	IN	VOP	+28 V±0.2 VDC
17	GND	---	GROUND	
18	PWIDTH	OUT	PAPER WIDTH SENSE	
19	GND	---	GROUND	
20	HRANK	OUT	HEAD HEAT RANK SENSE	
21	GND	---	GROUND	
22	TH1	OUT	THERMISTOR 1	
23	GND	---	GROUND	

Table 4-4 Carriage board connector assignment

CNHEAD (Carriage board to bubble jet head connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	HRANK	IN	HEAD HEAT RANK SENSE	
2	THERMH	IN	THERMISTOR	
3	THERMG	---	THERMISTOR GROUND	
4	VOP	OUT	VOP	+28 V±0.2 V
5	VOP	OUT	VOP	+28 V±0.2 V
6	RHEAT	OUT	HEATER DRIVE	HIGH/LOW(DRIVE)
7	GNDH	---	VH RETURN (GROUND)	
8	GNDH	---	VH RETURN (GROUND)	
9	GNDL	---	VCC RETURN (GROUND)	
10	GNDL	---	VCC RETURN (GROUND)	
11	VCC	OUT	VCC	+5 VDC
12	VCC	OUT	VCC	+5 VDC
13	CLKI	OUT	DATA TRANSFER CLOCK	
14	-LATI	OUT	DATA LATCH PULSE	HIGH/LOW(ENABLE)
15	-BEI4	OUT	HEAT PULSE 4	HIGH/LOW(ENABLE)
16	-BEI3	OUT	HEAT PULSE 3	HIGH/LOW(ENABLE)
17	-BEI2	OUT	HEAT PULSE 2	HIGH/LOW(ENABLE)
18	-BEI1	OUT	HEAT PULSE 1	HIGH/LOW(ENABLE)
19	ENBI	OUT	HEAD HEAT ENABLE	
20	RESI	OUT	RESET PULSE	
21	SI	OUT	DATA INPUT SIGNAL	
22	FHEAT	---	NOT USED	
23	VOP	OUT	VOP	+28 V±0.2 V

CNHP (HP sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	HPA	IN	PHOTO LED DRIVE	
2	HPG	---	HP SENSE COMMON	GND
3	HPC	OUT	HP SENSOR SENSE	HIGH(SENSE)/LOW

CNPW (Paper width sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	PWK	---	GROUND	
2	PWA	OUT	PHOTO LED DRIVE	
3	PWC	---	PHOTO LED DRIVE COMMON	
4	PWE	IN	PAPER WIDTH SENSE	

C) POWER SUPPLY UNIT

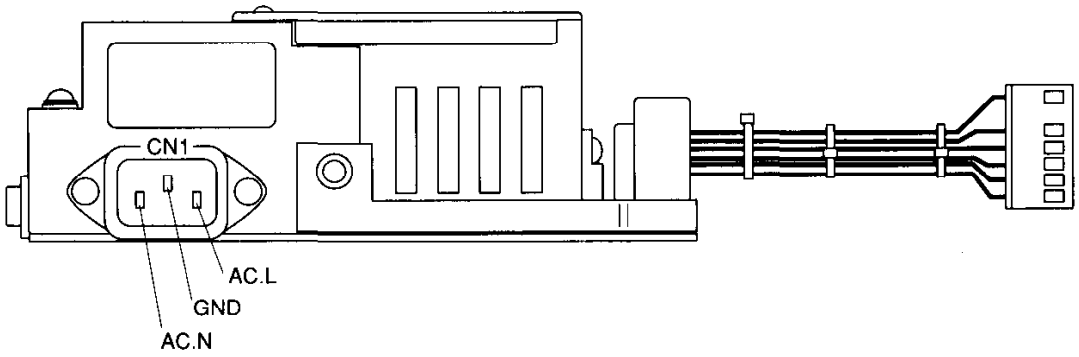


Figure 4-10 Power Supply Unit

Table 4-5 Power supply unit connector assignment

CN1 (Power inlet connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	AC.L	IN	AC LINE	
2	GND	---	GROUND	
3	AC.N	IN	AC NEUTRAL	

CN2 (DC Power out connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	OUT	VCC	+5 VDC
2	GND	---	GROUND	
3	VM	OUT	VM	+28 V±2 VDC
4	GND	---	GROUND	
5	VOP	OUT	VOP	+28 V±0.2 VDC
6	GND	---	GROUND	

5.2.2 SENSOR AND ACTUATOR PIN ASSIGNMENT

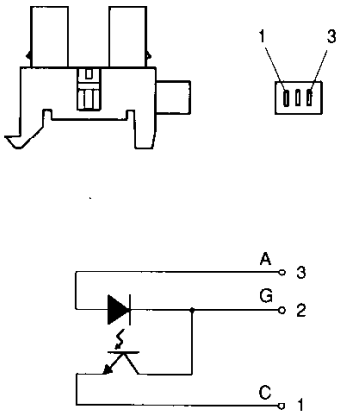
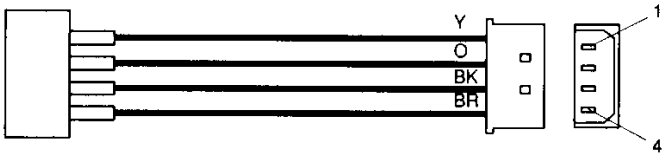


Figure 4-11 HP Sensor

Table 4-6 HP sensor connector assignment

HP SENSOR CONNECTOR

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	HPC	---	HP SENSE COMMON	
2	HPG	---	HP SENSOR SENSE	HIGH/LOW(SENSE)
3	HPA	---	PHOTO LED DRIVE	



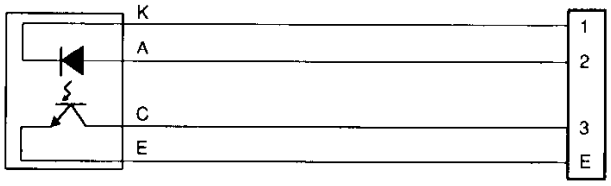


Figure 4-12 Paper Width Sensor

Table 4-7 Paper width sensor connector assignment

CNPW (Paper width sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	PWK	---	GROUND	
2	PWA	---	PHOTO LED DRIVE	
3	PWC	---	PHOTO LED DRIVE COMMON	
4	PWE	---	PAPER WIDTH SENSE	

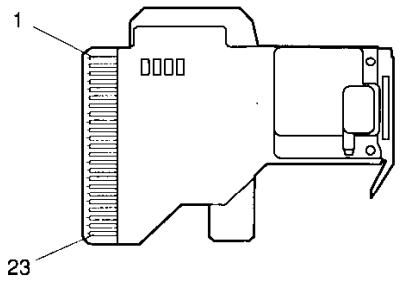


Figure 4-13 Bubble Jet Head

Table 4-8 Bubble jet head connector assignment

CNHEAD (Bubble jet head connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	HRANK	---	HEAD HEAT RANK SENSE	
2	THERMH	---	THERMISTOR	
3	THERMG	---	THERMISTOR GROUND	
4	VOP	---	VOP	+28 V±0.2 V
5	VOP	---	VOP	+28 V±0.2 V
6	RHEAT	---	HEATER DRIVE	HIGH/LOW(DRIVE)
7	GNDH	---	VH RETURN (GROUND)	
8	GNDH	---	VH RETURN (GROUND)	
9	GNDL	---	VCC RETURN (GROUND)	
10	GNDL	---	VCC RETURN (GROUND)	
11	VCC	---	VCC	+5 VDC
12	VCC	---	VCC	+5 VDC
13	CLKI	---	DATA TRANSFER CLOCK	
14	-LATI	---	DATA LATCH PULSE	HIGH/LOW(ENABLE)
15	-BEI4	---	HEAT PULSE 4	HIGH/LOW(ENABLE)
16	-BEI3	---	HEAT PULSE 3	HIGH/LOW(ENABLE)
17	-BEI2	---	HEAT PULSE 2	HIGH/LOW(ENABLE)
18	-BEI1	---	HEAT PULSE 1	HIGH/LOW(ENABLE)
19	ENBI	---	HEAD HEAT ENABLE	
20	RESI	---	RESET PULSE	
21	SI	---	DATA INPUT SIGNAL	
22	FHEAT	---	NOT USED	
23	VOP	---	VOP	+28 V±0.2 V

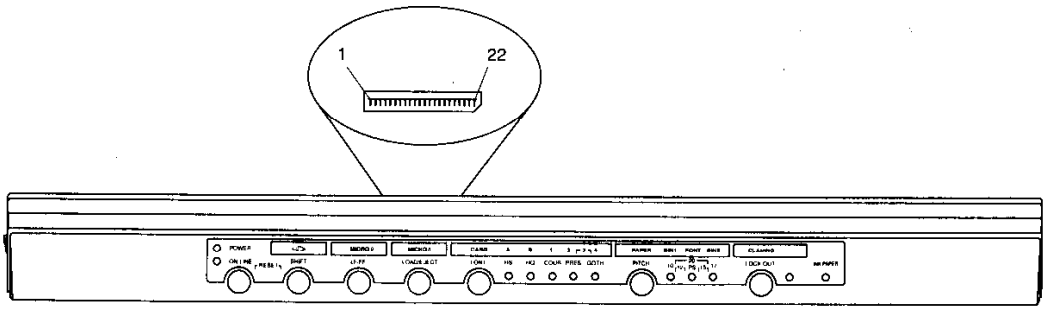


Figure 4-14 Operator Panel

Table 4-9 Operator panel connector assignment

OPERATOR PANEL CONNECTOR

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	VCC	---	VCC	+5 VDC
2	-LLO	---	LOCK OUT LED ENABLE	HIGH/LOW(ENABLE)
3	-L10	---	10 LED ENABLE	HIGH/LOW(ENABLE)
4	-LPS	---	PS LED ENABLE	HIGH/LOW(ENABLE)
5	-L17	---	17 LED ENABLE	HIGH/LOW(ENABLE)
6	-LSHIFT	---	SHIFT LED ENABLE	HIGH/LOW(ENABLE)
7	-LIN/PA	---	INK/PAPER LED ENABLE	HIGH/LOW(ENABLE)
8	-LHS	---	HS LED ENABLE	HIGH/LOW(ENABLE)
9	-LHQ	---	HQ LED ENABLE	HIGH/LOW(ENABLE)
10	-LCOUR	---	COUR LED ENABLE	HIGH/LOW(ENABLE)
11	-LPRES	---	PRES LED ENABLE	HIGH/LOW(ENABLE)
12	-LGOTH	---	GOTH LED ENABLE	HIGH/LOW(ENABLE)
13	-LONLINE	---	ON LINE LED ENABLE	HIGH/LOW(ENABLE)
14	-LPOWER	---	POWER LED ENABLE	HIGH/LOW(ENABLE)
15	KSHIFT	---	SHIFT KEY	N.O
16	KPITCH	---	PITCH KEY	N.O
17	KLO	---	LOCK OUT KEY	N.O
18	KFONT	---	FONT KEY	N.O
19	KLO/EJ	---	LOAD/EJECT KEY	N.O
20	KLF/FF	---	LF/FF KEY	N.O
21	KONLINE	---	ON LINE KEY	N.O
22	GND	---	GROUND	

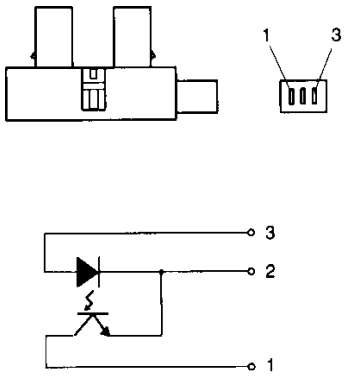


Figure 4-15 EOF Sensor

Table 4-10 EOF Sensor connector assignment

EOF SENSOR CONNECTOR

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	PE	---	END OF FORM SENSE	
2	GND	---	GROUND	
3	VCC	---	PHOTO LED DRIVE	

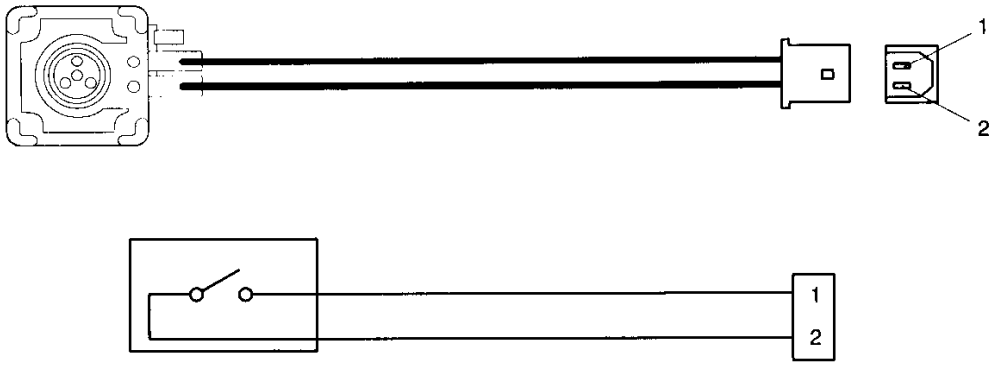


Figure 4-16 Ink Sensor

Table 4-11 Ink sensor connector assignment

J4 (Ink sensor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	INK	---	INK OUT SENSE	HIGH/LOW(SENSE)
2	-IEN	---	INK SENSE ENABLE	

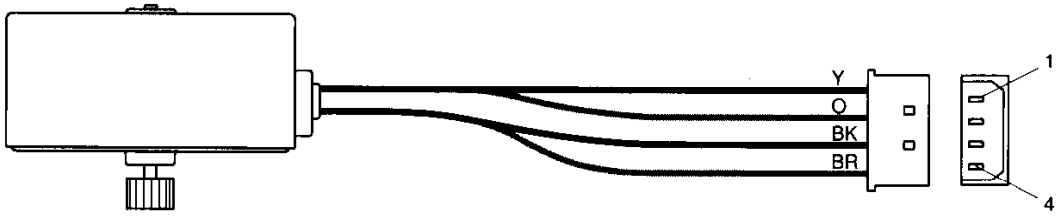


Figure 4-17 Paper Feed Motor

Table 4-12 Paper feed motor connector assignment

J5 (Paper feed motor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	A	---	P.F.MOTOR PHASE A	
2	-A	---	P.F.MOTOR PHASE -A	
3	B	---	P.F.MOTOR PHASE B	
4	-B	---	P.F.MOTOR PHASE -B	

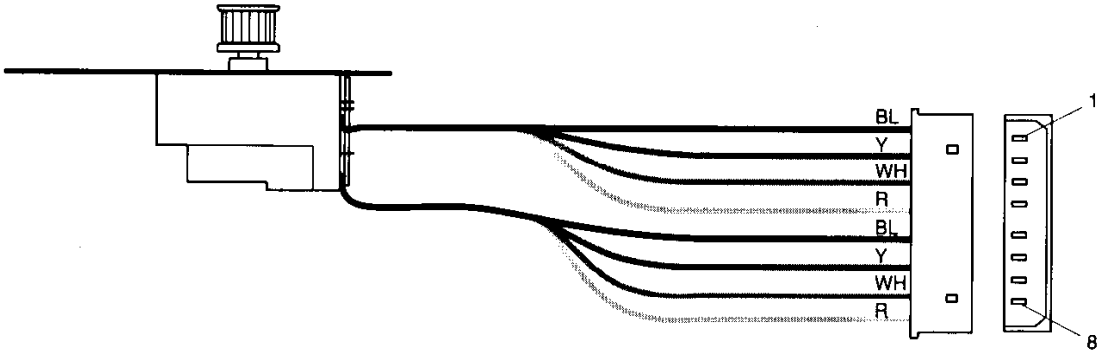


Figure 4-18 Carriage Dirve Motor

Table 4-13 Carriage drive motor connector assignment

J6 (Carriage drive motor connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	A-A	---	C.D. MOTOR PHASE A-A	
2	AA	---	C.D..MOTOR PHASE AA	
3	B-B	---	C.D..MOTOR PHASE B-B	
4	BB	---	C.D..MOTOR PHASE BB	
5	P A IN	---	PHASE A INPUT	
6	P B IN	---	PHASE B INPUT	
7	VCC	---	VCC	+5 VDC
8	GND	---	GROUND	

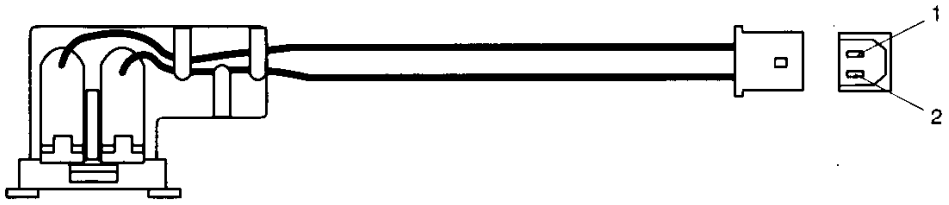


Figure 4-19 Electrode Unit

Table 4-14 Electrode unit connector assignment

J12 (Electrode unit connector)

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	IDS	---	INKCARTRIDGE OUT SENSE	
2	GND	---	GROUND	

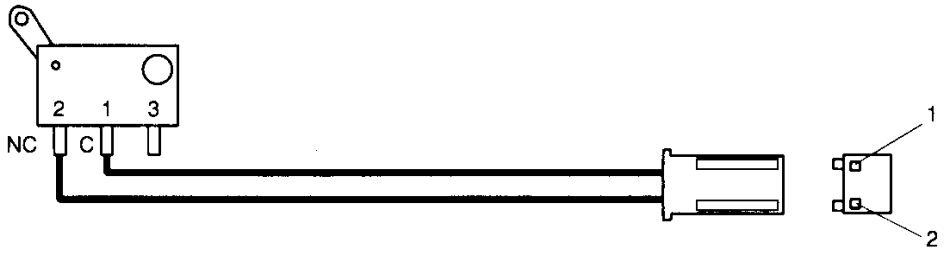


Figure 4-20 Paper Release Sensor

Table 4-15 Paper release sensor connector assignment

PAPER RELEASE SENSOR CONNECTOR

PIN NO.	SIGNAL	IN/OUT	FUNCTION	REMARKS
1	RRS	---	RELEASE POSITION SENSE	HIGH(RELEASE)/LOW
2	GND	---	GROUND	

5.2.3 CONNECTOR AND CABLE PIN ASSIGNMENT

EXTENSION CABLE(HP Sensor to Carriage board Cable)

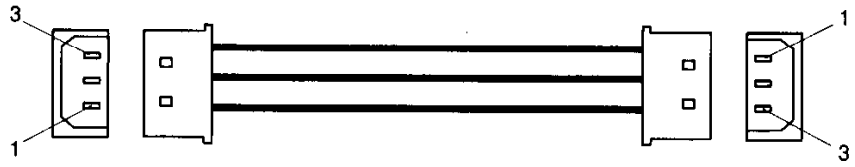


Figure 4-21 Extension Cable

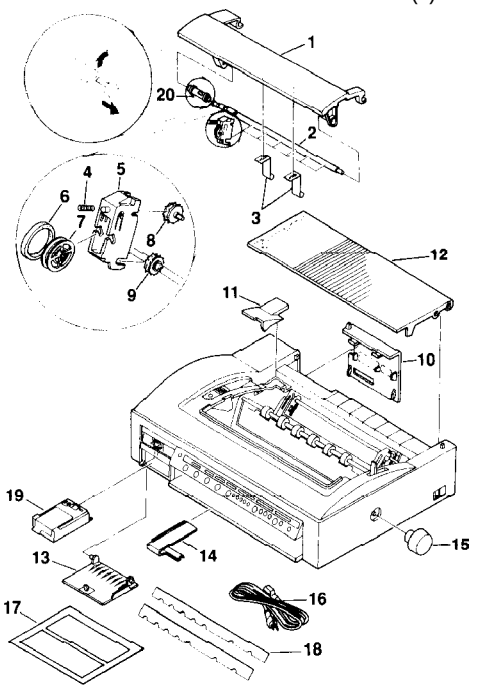
BJ-300

PARTS CATALOG

Canon

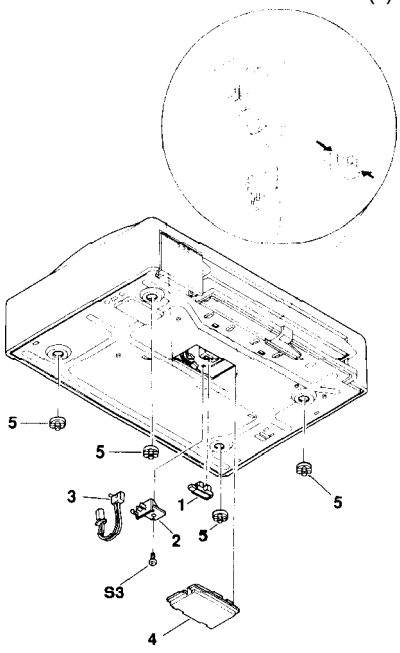
Canon

FIGURE 1 PRINTER MECHANISM (1)



NUM.	PART #	DESCRIPTION
1-1	QA2-0152-000	COVER, TOP
2	QA2-0164-000	SHAFT, SPUR
3	QA2-0532-000	LUG, GROUND (2)
4	QA2-0021-000	SPRING, SPUR (6)
5	QA2-0020-000	HOLDER, SPUR (6)
6	QA2-0024-000	ROLLER, SPUR CLEANING (6)
7	QA2-0023-000	WHEEL, SPUR CLEANER (6)
8	QA2-0022-000	SPUR, UPPER (6)
9	QA2-0183-000	SPUR, LOWER (6)
10	QA2-0055-000	COVER, REAR
11	QA2-0059-000	COVER, ASF GEAR
12	QA2-0153-000	GUIDE, CONTINUOUS FORMS
13	QA2-0056-000	COVER, FRONT
14	QA2-0044-000	GUIDE, LEFT EDGE
15	QA2-0054-000	KNOB
16	WT3-0059-000	CORD, POWER
17	QS1-1457-000	LABEL, SWITCH SETTING
18	QS1-1462-000	OVERLAY, PANEL
19	NPN	INK CARTRIDGE
20	QA2-0179-000	ROLLER, LEFT

FIGURE 2 PRINTER MECHANISM (2)



NUM.	PART #	DESCRIPTION
2-1	QH8-8300-000	SENSOR, EOF
2	QA2-0180-000	BRACKET, PAPER RELEASE SENSOR
3	QH8-8303-000	SENSOR, PAPER RELEASE W/ CONNECTOR
4	QA2-0098-000	COVER, BOTTOM
5	QA2-0092-000	FOOT (4)

Canon

FIGURE 3 PRINTER MECHANISM (3)

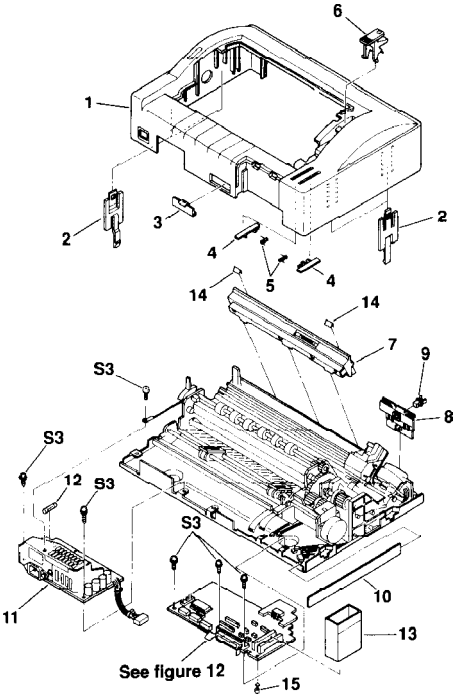
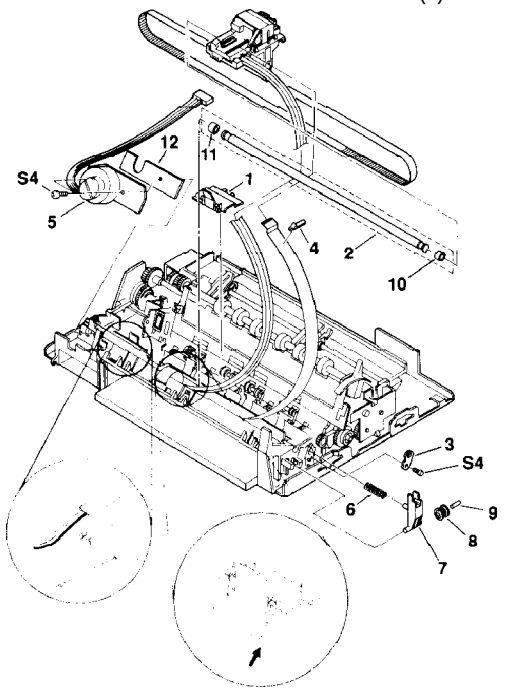


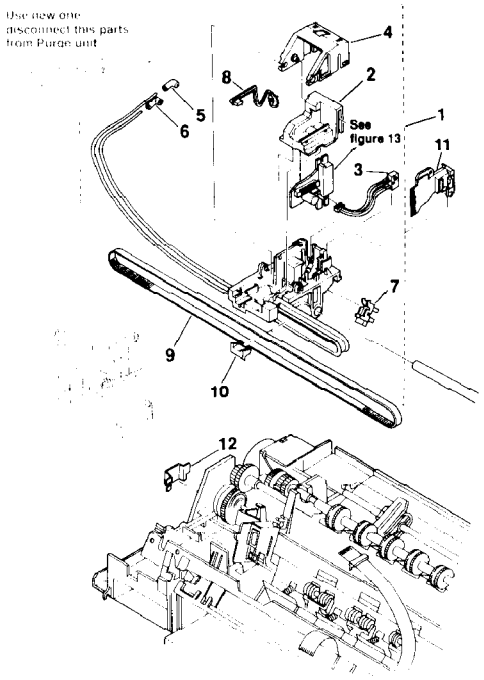
FIGURE 4 PRINTER MECHANISM (4)



NUM.	PART #	DESCRIPTION
3-1	QA2-0150-000	CASE, UPPER
2	QA2-0095-000	HOOK, UPPER COVER (4)
3	QA2-0186-000	COVER, SWITCH
4	QA2-0093-000	COVER, EXPANSION SLOT (2)
5	QA2-0094-000	SPRING, TORSION (2)
6	QA2-0187-000	HOOK, CARRIAGE
7	QH8-8291-000	PANEL, OPERATOR
8	QA2-0096-000	PLATE, COUPLER
9	RA1-8288-000	COUPLER
10	QA2-0141-000	PLATE, CABLE GUIDE
11	QH3-3070-000	UNIT, POWER SUPPLY
12	QY7-0366-000	FUSE, 125V 3.15A
13	QA2-0057-000	GUIDE, EXPANSION CARD
14	QA2-0705-000	DUMPER (2)
15	WT8-0054-000	SUPPORT, SPACER

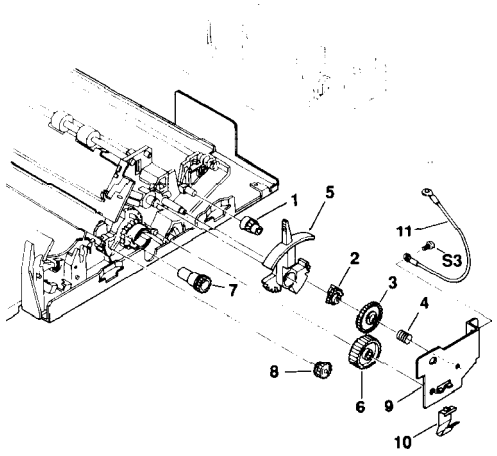
NUM.	PART #	DESCRIPTION
4-1	QA2-0084-000	GUIDE, INK TUBE
2	QG1-5174-000	CARRIAGE SHAFT UNIT
3	QA2-0176-000	BRACKET, CARRIAGE SHAFT
4	QA2-0065-000	PLATE, CABLE FIXING
5	QH4-4022-000	MOTOR, CARRIAGE DRIVE W/GEAR
6	QA2-0089-000	SPRING, COIL
7	QA2-0087-000	BRACKET, IDLER
8	QF1-5007-000	ROLLER, IDLER
9	QA2-0088-000	PIN, ROLLER
10	QA2-0257-000	DUMPER, RUBBER
11	QA2-0258-000	DUMPER, RUBBER
12	QA2-0529-000	DUMPER

FIGURE 5 PRINTER MECHANISM (5)



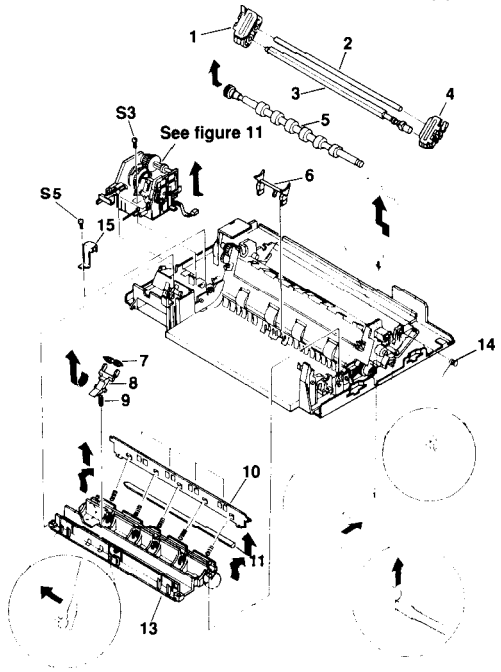
NUM.	PART #	DESCRIPTION
5 -1	QG1-5040-000	UNIT, CARRIAGE
2	QA2-0062-000	COVER, CARRIAGE
3	QH8-8316-000	SENSOR, PAPER WIDTH W/ CONNECTOR
4	QA2-0061-000	COVER, HEAD
5	QA2-0114-000	TUBE, PUMP JOINT
6	QA2-0070-000	TUBE, INK SENSOR JOINT
7	WG8-5036-000	SENSOR, HP W/CONNECTOR
8	QG2-2325-000	CABLE, EXTENSION W/CONNECTOR
9	QA2-0168-000	BELT, CARRIAGE
10	QA2-0064-000	PLATE, BELT CLAMP
11	QY6-0024-000	UNIT, BUBBLE JET HEAD
12	QA2-0698-000	COVER, TUBE JOINT

FIGURE 6 PRINTER MECHANISM (6)



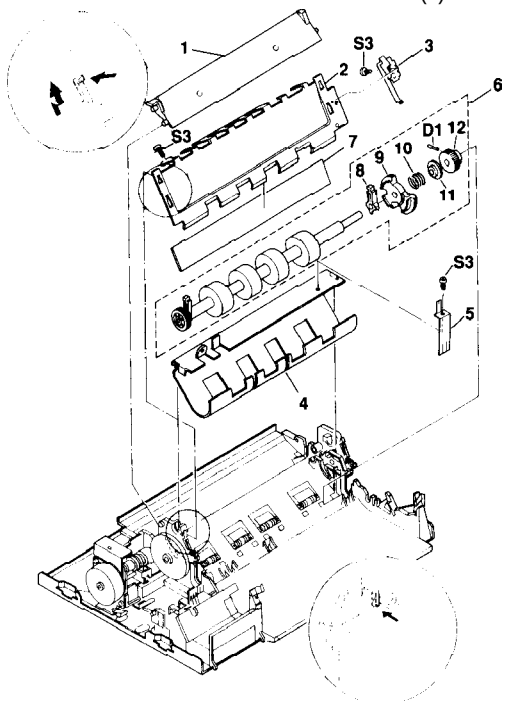
NUM.	PART #	DESCRIPTION
6-1	QA2-0077-000	GEAR, PIN FEED TRACTOR
2	QA2-0079-000	CAM, PAPER RELEASE
3	QA2-0081-000	GEAR, TRANSMISSION
4	QA2-0083-000	SPRING, COIL
5	QA2-0076-000	LEVER, PAPER RELEASE
6	QA2-0078-000	GEAR, TRANSMISSION
7	QA2-0082-000	GEAR, PINCH ROLLER RELEASE
8	QA2-0080-000	GEAR, GUIDE ROLLER RELEASE
9	QA2-0029-000	PLATE, GEAR SUPPORT
10	QA2-0172-000	PLATE, GROUND
11	QG2-2373-000	CABLE, GROUND W/LUGS

FIGURE 7 PRINTER MECHANISM (7)



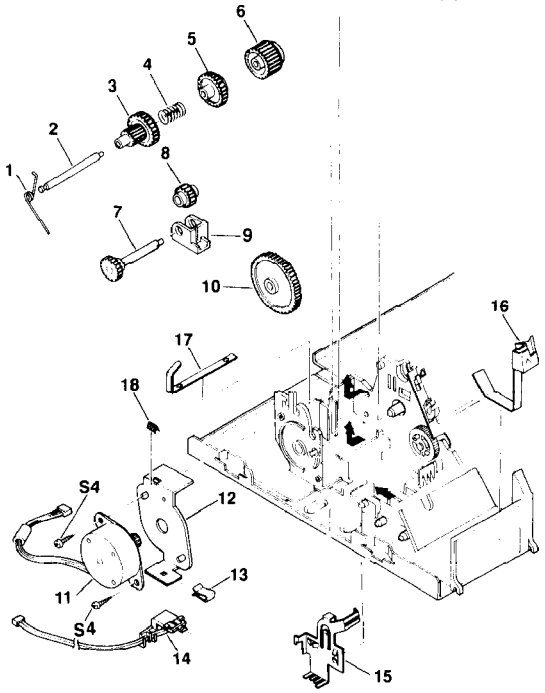
NUM.	PART #	DESCRIPTION
7-1	QA2-0182-000	PIN FEED WHEEL UNIT (L)
2	QA2-0162-000	SHAFT, GUIDE
3	QA2-0163-000	SHAFT, TRACTOR
4	QA2-0181-000	PIN FEED WHEEL UNIT (R)
5	QF1-5022-000	ROLLER, EJECT
6	QF1-5005-000	FLAG, EOF
7	QA2-0051-000	ROLLER, GUIDE (4)
8	QA2-0050-000	BRACKET, GUIDE ROLLER (4)
9	QA2-0048-000	SPRING, COIL (4)
10	QA2-0158-000	PLATE, PAPER GUIDE
11	QA2-0156-000	SHAFT, ROLLER RELEASE
12	QA2-0047-000	SPRING, COIL (5)
13	QA2-0155-000	PLATE, FRONT GUIDE
14	QA2-0171-000	SPRING, GROUND
15	QA2-0536-000	BRACKET, GUIDE

FIGURE 8 PRINTER MECHANISM (8)



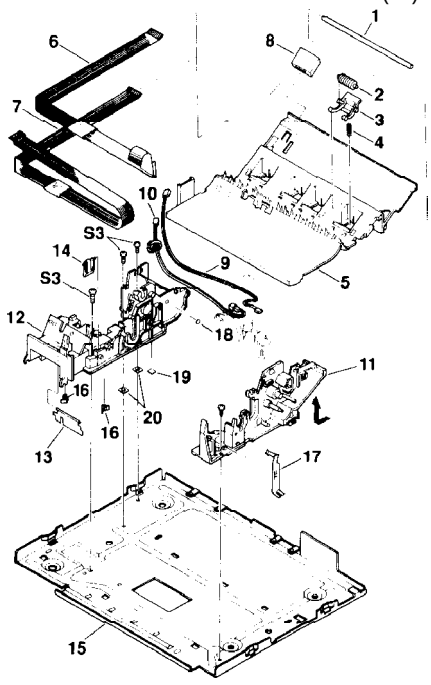
NUM.	PART #	DESCRIPTION
8 -1	QA2-0170-000	SEPARATOR
2	QA2-0159-000	PLATEN
3	QA2-0143-000	PLATE, GROUND
4	QA2-0157-000	DEFLECTOR, PAPER FEED
5	QA2-0145-000	LUG, GROUND
6	QG1-5037-000	PAPER FEED ROLLER UNIT
7	QA2-0527-000	DUMPER
8	QA2-0012-000	BUSHING (2)
9	QA2-0015-000	GEAR, RELEASE IDLER
10	QA2-0017-000	SPRING, COIL
11	QA2-0016-000	ROLLER, BRAKE
12	QA2-0014-000	GEAR, PAPER FEED ROLLER (R)

FIGURE 9 PRINTER MECHANISM (9)



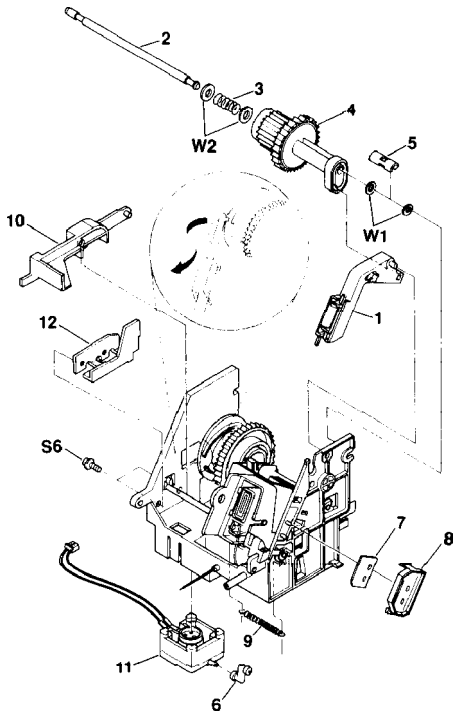
NUM.	PART #	DESCRIPTION
9-1	QA2-0297-000	SPRING, GROUND
2	QA2-0053-000	SHAFT, GEAR
3	QA2-0037-000	GEAR, PUMP SLOWDOWN
4	QA2-0039-000	SPRING, COIL
5	QA2-0036-000	GEAR, TRANSMISSION
6	QA2-0035-000	GEAR, ASF FEED
7	QF1-5004-000	ASSY, FEED GEAR
8	QA2-0033-000	GEAR, SLIDE
9	QA2-0032-000	HOLDER, SLIDE GEAR
10	QA2-0038-000	GEAR, TRANSMISSION
11	QH4-4021-000	MOTOR, PAPER FEED W/GEAR
12	QA2-0142-000	PLATE, GROUND
13	QA2-0300-000	LATCH, GROUND
14	QG1-5022-000	ELECTRODE UNIT W/CONNECTOR
15	QA2-0147-000	PLATE, GROUND
16	QA2-0173-000	LUG, GROUND
17	QA2-0299-000	PLATE, GROUND
18	QA2-0700-000	SHEET, DUMPER

FIGURE 10 PRINTER MECHANISM (10)



NUM.	PART #	DESCRIPTION
10-1	QA2-0156-000	SHAFT, ROLLER RELEASE
2	QA2-0040-000	ROLLER, PINCH (4)
3	QA2-0042-000	ARM, PINCH ROLLER (4)
4	QA2-0041-000	SPRING, COIL (4)
5	QA2-0154-000	PLATE, BASE
6	QH2-2071-000	CABLE, OPERATOR PANEL
7	QH2-2070-000	CABLE, CARRIAGE
8	WE8-5046-000	CORE, FERRITE
9	QG2-2326-000	CABLE, EXTENSION W/CONNECTOR
10	QG2-2327-000	CABLE, EXTENSION W/CONNECTOR
11	QA2-0002-000	FRAME, RIGHT
12	QA2-0003-000	FRAME, LEFT
13	QA2-0075-000	PROTECTOR, NEEDLE
14	QA2-0074-000	PLATE, LOCK
15	QF1-5021-000	CASE, BOTTOM W/FEET
16	QA2-0097-000	DUMPER (2)
17	QA2-0174-000	LUG, GROUND
18	QA2-0178-000	INSULATOR
19	QA2-0704-000	DUMPER (2)
20	QA2-0705-000	DUMPER

FIGURE 11 PURGE UNIT



NUM.	PART #	DESCRIPTION
11-	QG1-5100-000	PURGE UNIT
1	QG1-5015-020	BLOTTER ARM UNIT
2	QA2-0109-000	SHAFT, PURGE GEAR
3	QA2-0090-000	SPRING, COIL
4	QA2-0120-000	GEAR, PURGE
5	QA2-0026-000	LOCK, CAM
6	QA2-0137-000	FITTING
7	QA2-0132-000	WIPER
8	QA2-0113-000	HOLDER, WIPER
9	QA2-0115-000	SPRING, HOOK END COIL
10	QA2-0112-000	ARM, PUMP
11	QH8-8298-000	SENSOR, INK
12	QA2-0653-000	PLATE, GUIDE

NUM.	PART #	DESCRIPTION